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Annual Inventory Report for Pennsylvania's Forests: Results from the First Three Years

William H. McWilliams
Carol A. Alerich
Daniel A. Devlin
Andrew J. Lister
Tonya W. Lister
Stephen L. Sterner
James A. Westfall

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Abstract

In 2000, the USDA Forest Service's Forest Inventory and Analysis program implemented a new system for inventory and monitoring Pennsylvania's forests. The most salient feature of the new inventory process will be a nearly threefold improvement in timeliness. This report summarizes the results for the first 3 years of annual inventory measurements. The area of forest land in Pennsylvania has remained stable since a previous inventory in 1989. The State's forests continue to mature as larger trees and an increase in inventory volume were recorded. A separate study of tree seedlings revealed a general lack of regeneration in half of stands in which regeneration should be adequate.

The Authors

WILLIAM H. MCWILLIAMS, CAROL A. ALERICH, ANDREW J. LISTER, TONYA W. LISTER, AND JAMES A. WESTFALL are researchers with the Northeastern Research Station's Forest Inventory and Analysis unit in Newtown Square, Pennsylvania. DANIEL A. DEVLIN and STEPHEN L. STERNER are foresters with the Pennsylvania Department of Conservation, Bureau of Forestry, Harrisburg, Pennsylvania.

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Executive Summary

In 2000, the USDA Forest Service's Forest Inventory and Analysis (FIA) program implemented a new system for inventorying and monitoring Pennsylvania's forest resources. The most salient benefit of the new system is a nearly threefold improvement in timeliness. The extension of the sample includes a broader range of measurements that will help analysts understand the relationships between resource change and underlying ecological variables.

This report contains results from the first 3 years of implementation. Included are findings from three panels of FIA sample plots, as well as 2 years of data from the Pennsylvania Regeneration Study. Two new features of the inventory process are the use of digital satellite imagery for Phase 1 estimates and a statewide pilot study of invasive-plant sampling on all regeneration sample plots.

According to the first three panels of inventory data, Pennsylvania has 16,652,100 acres of forest land (confidence interval of ±149,869 acres). This compares to the 1989 estimate of 16,704,400 forested acres (±100,226 acres). Although it would appear that the area of forest land decreased slightly, the two confidence intervals overlap, so there is no statistically significant trend.

The distribution of forest land by forest-type group has been stable over the past decade, but that is likely given that Pennsylvania's forests have been maturing gradually over time. The distribution of the specific oak types also is relatively stable and has possibly increased over the past decade. One trend that is evident is specific forest types that are dominated by red maple increased by 22 percent.

The distribution of forest land by stand-size class highlights a long-term trend that has been developing in Pennsylvania for some time—the gradual maturing of a tremendously diverse and valuable resource. This maturing is highlighted by a decrease in sapling-seedling stands and an increase in sawtimber stands. The decrease in the young sapling-seedling class has become a long-term and negative trend. The situation bears close monitoring because of the impacts on young successional forest-dependent wildlife species. The other striking trend is the continued increase in sawtimber stands.

The total sound-wood volume of live trees on forest land increased from 27.5 to 33.7 billion cubic feet, a 23-percent increase. Increases were noted for both softwood and hardwood inventory volumes. Increases were significant for 9 of the 10 most abundant species (the exception was sugar maple).

The total volume of sawtimber on timberland increased from 72.8 billion board feet (International ¼-inch rule) in 1989 to 86.3 billion board feet in 2002, an increase of 18 percent. Increases were noted for both softwoods and hardwoods. Again except for sugar maple, Pennsylvania's top 10 species increased significantly in sawtimber volume.

The basic findings of increased area of sawtimber-size stands, numbers of larger trees, cubic-foot volume, and sawtimber volume support the conclusion that Pennsylvania's forests are maturing and accumulating older, high-value trees. Within the context of Pennsylvania's long-term history of forest utilization, it can be concluded that Pennsylvania contains more timber today than at any time since the late 1800's.

Regardless of the perspective taken, it is clear that the regeneration picture in Pennsylvania is bleak based on findings from the first 2 years of data. Despite some variation across the State, it is appropriate to say that the regeneration problem is ubiquitous rather than specific to a particular region, owner, or forest type. Applying a middle-ground indicator that gauges the ability to regenerate with any high-canopy species reveals that only 50 to 65 percent of the samples satisfied guidelines on advance tree-seedling and sapling regeneration (ATSSR) for high and moderate deer-population pressure, respectively. From a more conservative timber management perspective, only 36 to 52 percent satisfied ATSSR guidelines.

Annual Data: Continual Forest Monitoring

The USDA Forest Service's Forest Inventory and Analysis (FIA) program has been conducting forest inventories in Pennsylvania since the 1950's. Periodic reports on the status of and changes in forest conditions were completed for 1955 (Ferguson 1955), 1965 (Ferguson 1968), 1978 (Considine and Powell 1980), and 1989 (Alerich 1993). In 2000, FIA implemented a new system for inventorying and monitoring Pennsylvania's forest resources. In the past, "periodic" inventories were conducted in the State every 10 to 15 years. As the value of the Keystone State's forested ecosystem continued to increase and questions concerning the condition and health of this valuable resource mounted, it became clear that more timely data gathering and monitoring were needed. In conjunction with the Pennsylvania Bureau of Forestry (PBF), FIA has adapted an annual inventory system under which the length of the inventory cycle has been shortened to 5 years and measurements are collected continually across the State. A report on the first 2 years of inventory measurements was published in 2002 (McWilliams and others 2002a)

This report is an update of the 2002 report that utilizes the first 3 years of inventory data. Included are findings from three panels of FIA sample plots, as well as 2 years of regeneration sampling. Two new features of the inventory process are the use of digital satellite imagery for Phase 1 estimates and a statewide pilot study of invasive-plant sampling on all regeneration sample plots.

Annual Inventory Design

The annual inventory system combines features of the periodic system with a new systematic grid of sample plots and incorporates measurements from the Forest Health Monitoring (FHM) program. The inventory consists of three phases.

Phase 1

Until this year, estimates of forest attributes have been based on simple random sampling, that is, each sample plot received equal weight (or was assigned an equal number of acres for expansion to the population level). This year a statistical estimation technique was used to classify digital satellite imagery and stratify the land base as forest or nonforest to assign more representative number of acres to each sample plot and to reduce variance. Source data are from recent Landsat Thematic Mapper imagery with 30-meter resolution. An image filtering technique was used to classify individual pixels. The method uses a 5- by 5-pixel region surrounding each pixel containing a sample plot. The resulting 25 classes were then collapsed for each estimation unit (county or supercounty). By assigning each plot to one of these collapsed strata and by calculating the area of each collapsed stratum in each estimation unit, stratified estimation procedures could be applied. Stratified estimation produces more precise estimates than simple random sampling. The stratum weights and plot assignments were done at the inventory region level based on an assessment of the sampling intensity for three panels of data.

Phase 2

Field measurements are conducted at sample locations distributed systematically about every 3 miles across the landscape. Sample locations are situated within individual cells of a hexagonal grid laid across the State. Each year, 20 percent of the sample locations are measured, that is, it takes 5 years to complete the inventory. Each year's sample is referred to as an "inventory panel." The overall design is referred to as an "interpenetrating design" because within each inventory panel, no cell is adjacent to another. As a result, each panel provides an unbiased representation of conditions across the State. Prior to the implementation of stratification, Phase 1 procedures, each sample location was weighted according to the area of a single hexagonal cell, or roughly 6,000 acres of land. The new design also incorporates a change to a four-subplot cluster.[1] At each location, a suite of variables is measured that characterizes the land and trees associated with the sample.

Phase 3

On a limited number of Phase 2 locations, more extensive forest-health measurements are conducted during a 10-week period in summer. The measurements are grouped into four general categories of indicators: crown condition, down woody debris, soil condition, lichen communities, and ozone damage. The intensity of the Phase 3 sample is one sample location per 95,000 acres of land.

To better address the issue of regeneration in the State, the PBF is funding a study to quantify the composition, abundance, and quality of tree seedlings and other understory vegetation on Phase 2 sample plots. The Pennsylvania Regeneration Study (PRS) is part of a larger research initiative undertaken by the PBF, two

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[1] Northeast field guide, field manual version 1.7. On file with the Northeastern Research Station, Forest Inventory and Analysis, 11 Campus Blvd., Suite 200, Newtown Square, PA 19073.

Northeastern Research Station silvicultural research labs, and the School of Forest Resources of The Pennsylvania State University. The northeastern FIA samples complement research at these cooperating institutions aimed at developing site- and species-specific stocking guidelines and management criteria. A 1-year pilot study designed to evaluate techniques for measuring tree seedlings and other understory vegetation on FIA sample locations was completed in 2000 (McWilliams and others 2002b). Starting in 2001, all established tree seedlings at least 2 inches tall are being tallied by species, seedling source, and height class on a subset of sample locations measured during the leaf-on season (referred to as a subpanel). Percent cover of other understory vegetation also is being measured. Along with other Phase 2 measurements, these samples will help scientists evaluate the forest's regenerative capacity and the impact of other vegetation.

During this past field season, a new pilot study of exotic plants inventory techniques was initiated on all forested regeneration samples. Each 24-foot radius subplot is being examined for the presence or absence of 30 invasive plant species. The list of species includes exotic species from Federal and state lists of invasive species. Findings from this year's measurements will form the basis for future refinements and use of these data.

Under the annual inventory system, field crews within the State measure one panel of Phase 2 and 3 samples each year. Once the first 5 years of data are complete, a more comprehensive report covering forest resources will be generated. Following that, each year's measurements will replace the oldest year's data, providing the ability to provide new estimates each year.

Limitations: Caution in Early Years of Implementation

While the new system is being implemented, several aspects of the inventory results will require careful scrutiny. Because of the interpenetrating design of the new sample grid, each year's inventory panel provides unbiased estimates of resource attributes. However, until the first 5 years of measurements are complete, sampling errors will be larger, making it more difficult to detect changes in inventory. The issue of sampling error is particularly acute for evaluating estimates for subregions of the State, for example, ecoregions or counties. As a result, a table containing sampling errors accompanies each 2002 resource table in the Appendix. When analyzing the statistics for a change in conditions, one also should examine the confidence intervals of estimates. If confidence intervals do not overlap, there is evidence to suggest true resource change; if the intervals overlap, evidence for resource change is less certain. Sampling errors were computed for the 67-percent level of confidence or two chances in three. Note that 67-percent confidence intervals provide liberal bounds on the estimates, making it easier to infer change but at the expense of statistical confidence.

Analysis of certain plot-characterization variables will require scrutiny during the early years of implementation. An example is the analysis of changes in the distribution of forest land by forest-type group and stand-size class. The current algorithm for determining these variables has changed since 1989 and during the next several years will undergo modifications to comply with national standards and procedures. For this report, the 1989 sample data were recompiled with the current algorithm used by the northeastern FIA unit. A set of the revised 1989 tables is included in the Appendix. Estimates of the distribution of forest land by forest-type group are presented for only the two most recent inventory dates due to the vagaries associated with compilation procedures prior to 1989. For pre-1989 inventories, estimates of the distribution of forest land by stand-size class should be comparable because these compilation procedures are simpler than those for forest-type group. Estimates for older inventories were prorated to provide comparable statistics for graphical analysis; previous reports were for "timberland" and contemporary analyses are for "forest land." Timberland represents that portion of forest land that is capable of producing more than 20 cubic feet per acre per year and that is not withdrawn from timber utilization. The more extensive land class, forest land, includes tracts of land that are at least 1 acre in size, at least 120 feet wide, and not developed for a nonforest land use.

Evaluation of long-term trends in the numbers of trees is based on trees measured on timberland because only trees on timberland were reported in older inventories. The distribution of live trees per acre of forest land is a valuable indicator of broad structural changes affecting the entire forest. However, these data are available only for the 1989 and 2002 inventories. Trends as far back as the 1965 inventory are available for growing-stock trees that are larger than 5.0 inches in diameter. This furthers limits one's ability to examine the entire forest structure because sapling, rough, rotten, and standing dead trees are excluded.

The components of inventory change—growth, removals, and mortality—are the primary indicators of flux and sustainability of forest land. However, estimates of these components will be of limited use during the early years of the annual inventory process. Two factors that affect the estimation of change components are the percentage of sample locations and trees that are remeasured. The hexagonal grid system used for the new annual inventory replaces the grid of stratified random locations used for the 1989 inventory. During the installation of the hexagonal grid, each cell was examined to determine whether it contained a previously measured FHM or FIA sample. About 55 percent of the hexagons contained previously measured samples. On remeasured sample locations, the new four-subplot cluster is centered over the 1/5th-acre sample design used in 1989. At individual sample locations, only trees on the central 1/24th-acre center subplot that is overlaid on the old 1/5th-acre design are being remeasured. As such, about 13 percent of the sample trees will be remeasured during the first 5-year cycle that began in 2000 and will be completed in 2004. This means that sampling errors will be particularly high for estimates of components of change. As each new measurement panel is completed during the second 5-year cycle that will be completed in 2009, sampling errors will be reduced dramatically.

Overall "net change" in inventory is a useful surrogate indicator of sustainability during the early years. Net change in inventory expressed in net cubic feet[2] and board feet[3] summarizes the effects of growth, removals, and mortality. Net growth is equal to gross growth minus mortality. Net change is equal to net growth minus removals. Positive changes in inventory volume reflect conditions such that net growth exceeds removals. Negative changes reflect situations in which removals exceed net growth—a key indication of unsustainable conditions in the near term. Change in inventory volume is a useful indicator of trends for the major species groups within Pennsylvania. Although only the 1989 and 2002 inventories are examined, we recommend that more than two points in time be examined. For example, evaluating three points in time may reveal that a positive net change followed a negative change of similar magnitude, supporting little overall change for the period examined.

Benefits: More Rapid and Complete Resource Analyses

Perhaps the most salient benefit of the new inventory system will be the nearly threefold improvement in timeliness. A complete new inventory will be available in 3 years (the end of the first 5-year cycle) with updates on conditions available yearly thereafter as needed. The installation of a single remeasured sample design across the State will greatly improve the quality of information on change in resource extent, status, and condition. The use of this national sample design will facilitate resource assessments that straddle traditional regional and state boundaries to include Pennsylvania's results within the Mid-Atlantic region, as well as national and international assessments.

The extension of the sample to include a broader range of measurements will help analysts understand the relationships between resource change and underlying ecological variables. In particular, the implementation of a suite of forest health variables (Phase 3) will foster a better understanding of conditions on Phase 2 plots. The results of the PRS will aid in evaluating forest composition over the longer term. The new invasive-plant survey will assist in analyzing the extent of invasive plants.

The hiring of permanent field crews is a significant advantage over the use of temporary crews. Under the new design, crew members will be visiting sample locations within their region year after year, enhancing their ability to locate samples, obtain permission from landowners, identify local species, evaluate tree quality, understand forest composition and management activities, and measure the forces affecting resource change in their region.

All of the improvements in the inventory system have been accompanied by technological improvements since the 1989 inventory, for example, the ability to conduct sophisticated geospatial analyses. Geographic Information Systems, improved database management systems, and satellite-based land classification systems will provide map-based products, links to auxiliary datasets, and improved geospatial modeling. Of particular interest will be the ability to portray resource statistics for geographic regions of interest, i.e., ecoregions, inventory regions, climate zones, watersheds, pest outbreak zones, large disturbance areas, or congressional districts.

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[2] Net cubic-foot volume of the central stem of trees at least 5.0 inches in diameter at breast height from a 1-foot stump to a 4-inch top or a point where the stem breaks into limbs.

[3] Net board-foot volume of the central stem of softwood trees at least 9.0 inches in diameter and hardwood trees at least 11.0 inches in diameter from a 1-foot stump to a 7.0-inch top for softwoods and a 9.0-inch top for hardwoods or to a point above which a sawlog cannot be produced.

The Annual Inventory: Results from the First Three Years

Forest Land

Pennsylvania's landscape is characterized by a complex mix of land uses with forest land typically the residual land use, or the use for which there is no higher economic demand. Use of land by humans dominates forest character, with forests, farms, and urban and industrial lands intermingled. This creates a diverse mix of issues and concerns to be addressed by the forest inventory. For example, alternate food sources for deer populations eases the pressure on forest regeneration in regions of the State where forests are mixed with agricultural land. In heavily forested regions, few sources of available food and high deer populations have obliterated tree seedlings in the forest understory over large areas.

The first three panels of inventory data indicate that Pennsylvania has 16,652,100 acres of forest land (confidence interval of ±149,869 acres). This compares to the 1989 estimate of 16,704,400 forested acres (±100,226 acres). Although it would seem that the area of forest land decreased slightly, the two confidence intervals overlap, so there is no statistically significant trend. It is interesting to contrast the recent leveling of the forest-land base in Pennsylvania with more significant changes that occurred earlier in the century (Fig. 1). The total area of forest land in the State has been relatively stable since the mid-1960's.

Ecoregions

A useful way to partition the State is by ecoregions (Bailey 1995) that supplement FIA inventory regions. Ecoregions often correspond with natural phenomena that forge forest composition, structure, and function. It is important to scale the analysis of forest land to an area that will yield a statistically reliable estimate of forest condition. Ecological Divisions, Provinces, and Sections of interest in Pennsylvania are shown in Figure 2.

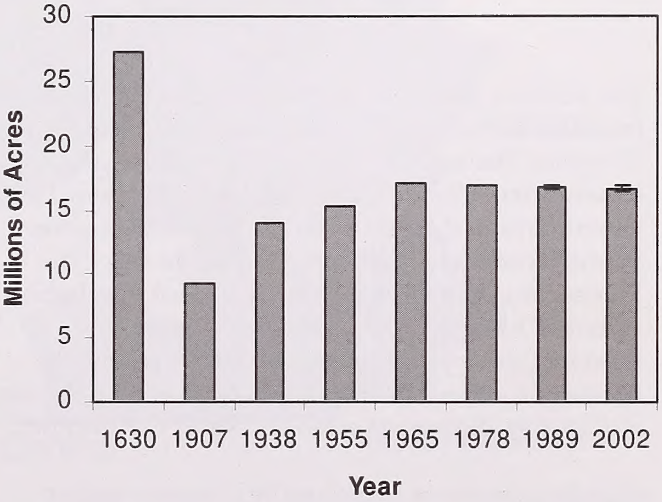

Figure 1.—Area of forest land by year, Pennsylvania, 1630, 1907, 1938, 1955, 1965, 1978, 1989, and 2002 (estimates for inventory years prior to 1955 are from Smith and others 2001).

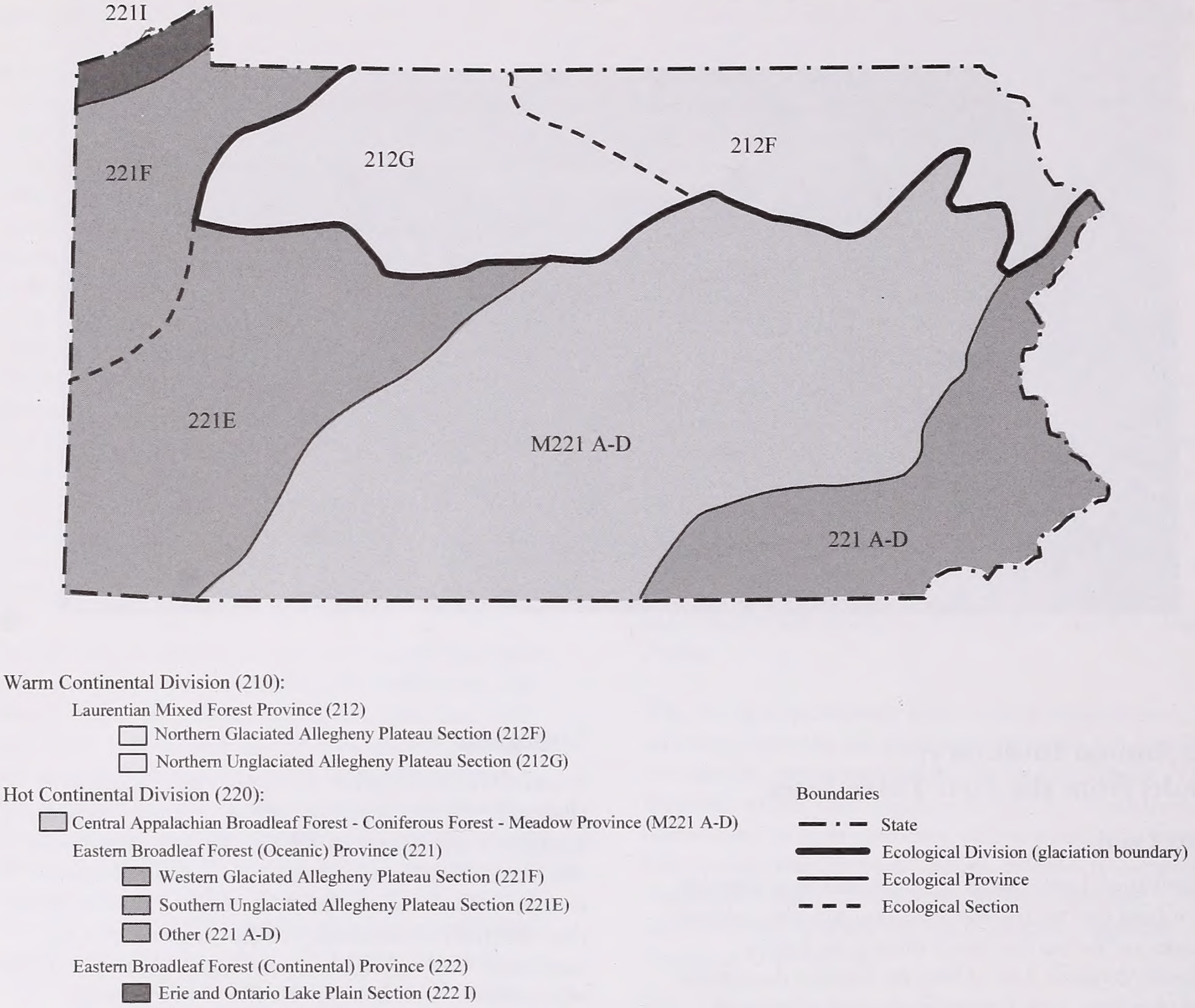
221I
221F
212G
212F
221E
M221 A-D
221 A-D
Warm Continental Division (210):
Laurentian Mixed Forest Province (212)
☐ Northern Glaciated Allegheny Plateau Section (212F)
☐ Northern Unglaciated Allegheny Plateau Section (212G)
Hot Continental Division (220):
☐ Central Appalachian Broadleaf Forest - Coniferous Forest - Meadow Province (M221 A-D)
Eastern Broadleaf Forest (Oceanic) Province (221)
▨ Western Glaciated Allegheny Plateau Section (221F)
▨ Southern Unglaciated Allegheny Plateau Section (221E)
▨ Other (221 A-D)
Eastern Broadleaf Forest (Continental) Province (222)
■ Erie and Ontario Lake Plain Section (222 I)
Boundaries
State
Ecological Division (glaciation boundary)
Ecological Province
Ecological Section

Figure 2.—Ecoregions of Pennsylvania.

The northern tier of Pennsylvania contains the major boundary between the Warm and Hot Continental Divisions. The Laurentian Mixed Forest Province is separated into Glaciated and Unglaciated Sections. The Eastern Broadleaf Forest (Oceanic) Province comprises several Sections that were combined on the map. This Province is split in the middle by the Central Appalachian Broadleaf Forest – Coniferous Forest – Meadow Province (the Appalachian Mountains). A prominent feature of the Province and Section boundaries is the line of glaciation that weaves across the State's northern tier.

Current estimates of forest land by ecoregion suggest slight increases have been occurring in the Plateau ecoregions, though confidence intervals do overlap. Also, it would seem that the southern ecoregions may be experiencing decreases.

Inventory Regions

The implementation of Phase 1 stratification included optimization at the inventory-region level to facilitate trend estimates. The FIA inventory regions (Fig. 3) subdivide the state into groups of counties with physiographic and political similarities. The results are similar to the ecoregion findings because they generally suggest slight increases in northern-tier regions and decreases in southern regions (Fig. 4). Caution should be used in interpreting these results because although the forest-land base is changing, the changes are small enough to make them difficult to detect and conclusions may be weak in some cases. For example, the results show an increase in forest land in the North-Central region between 1989 and 2002. This increase followed a decrease between 1978 and 1989.

	Forest land area	
Ecoregion[a]	1989[b]	2002[b]
	— *Thousand acres* —	
Warm Continental Division:		
Laurentian Mixed Forest Province		
Northern Glaciated Allegheny Plateau Section	2,411.6	2,450.6
Northern Unglaciated Allegheny Plateau Section	3,117.7	3,263.8
Subtotal	5,525.3	5,714.4
Hot Continental Division:		
Eastern Broadleaf Forest (Oceanic) Province		
Southern Unglaciated Allegheny Plateau Section	2,660.7	2,650.0
Western Glaciated Allegheny Plateau Section[b]	1,230.6	1,153.6
Other	836.5	702.3
Subtotal	4,727.8	4,505.9
Central Appalachian Broadleaf Forest - Coniferous Forest - Meadow Province[c]	6,451.2	6,431.7
Total	16,704.3	16,652.1

[a] See Bailey (1995).

[a] Sampling errors range from 3.1 to 11.3 percent.

[b] Includes 151,800 and 144,400 acres of the Erie and Ontario Lake Plain Section.

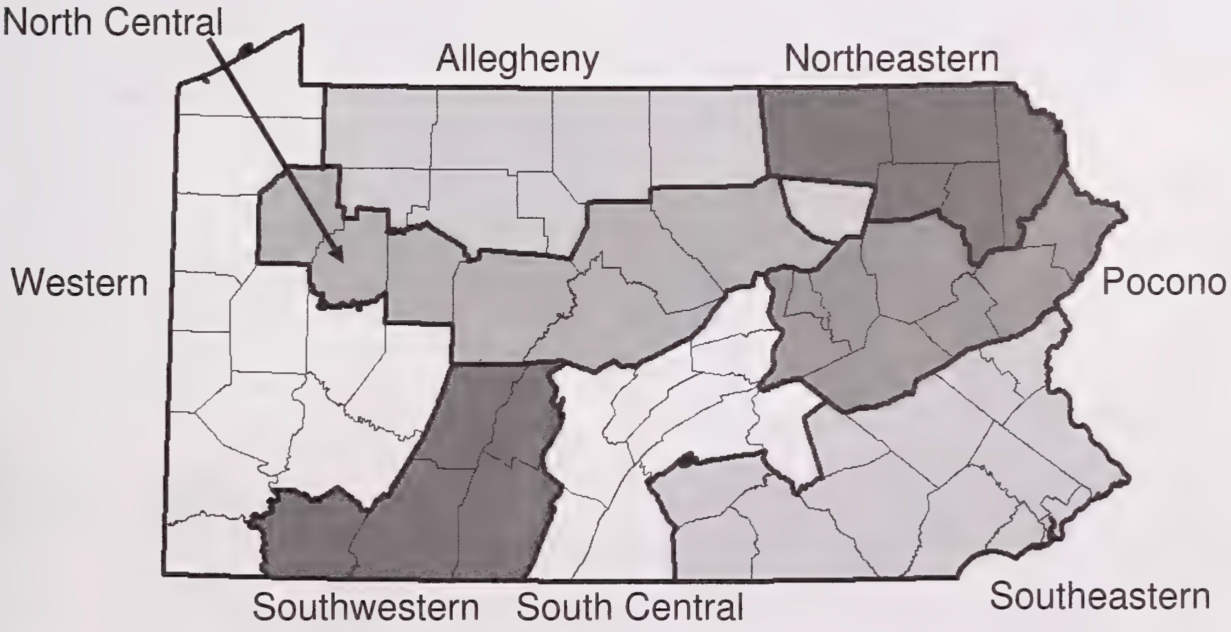

Figure 3.—Inventory regions of Pennsylvania.

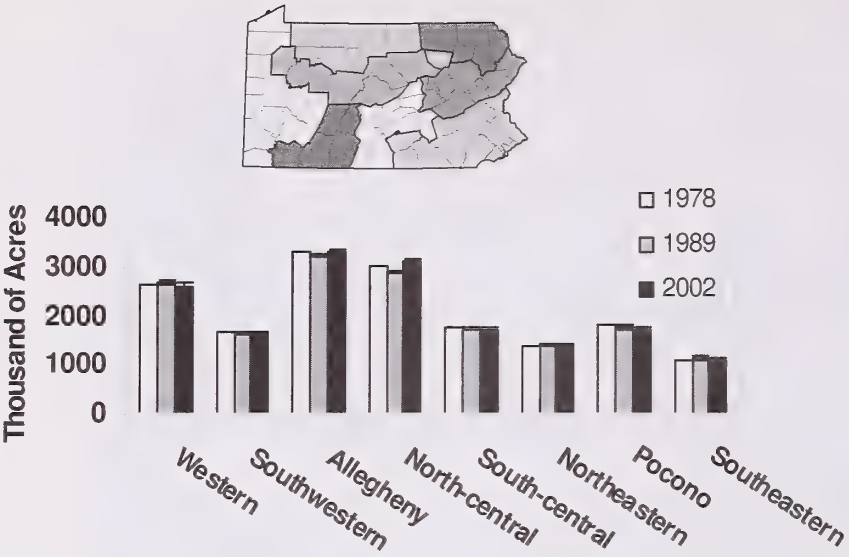

Figure 4.—Area of forest land by inventory region, Pennsylvania, 1978, 1989, and 2002 (error bars reflect 67-percent confidence interval; not available for 1978).

Forest-Type Group and Stand-Size Class

The forest types and groupings used by FIA are useful for tracking changes through time. In fact, FIA has used the same forest-type naming and grouping system over the years to ensure the best trend information possible. Although the goal has been to track forest types over decades, there are inherent difficulties. For example, because the data are not in digital form, we cannot use the new classification algorithms to reconfigure past inventory data to current standards. As a result, information on forest-type group is shown for only the 1989 and 2002 inventories (Fig. 5). It is clear that the distribution of forest land by forest-type group has been stable over the past decade, but this is likely because Pennsylvania's forests have been maturing gradually. At this level of data use, FIA inventories generally monitor only major disturbance events or other shifts in composition. Thus, no sweeping changes would be anticipated. The oak-hickory group decreased by 3 percent since 1989, but this change is relatively minor. Also, the current acreage of oak-hickory probably is greater than in the 1978 inventory even though a precise estimate for that inventory is not reliable due to computational differences. The distribution of the specific oak types also seems relatively stable. The only other trend that is evident from forest-type information is that red-maple types increased by more than 20 percent. More detailed shifts in specific types cannot be discerned with only three panels of inventory data. It will be useful to examine the more detailed forest-type data generated by FIA as they become available.

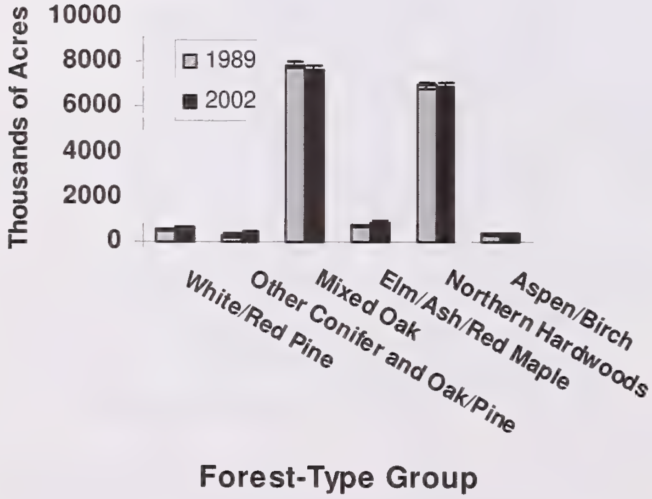

Figure 5.—Distribution of forest land by forest-type group, Pennsylvania, 1989 and 2002 (error bars reflect 67-percent confidence interval).

As with forest-type groups, the distribution of forest land by stand-size class points out the gradual maturing of forest land (Fig. 6). This maturing has been marked

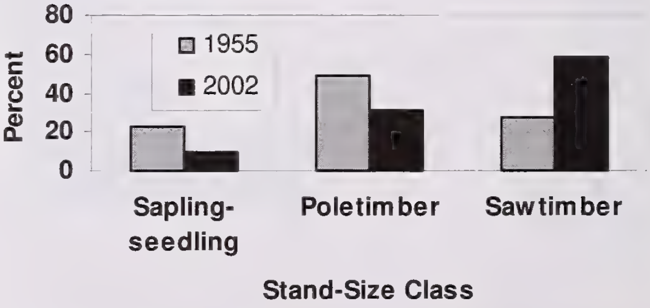

Figure 6.—Distribution of forest land by stand-size class, Pennsylvania, 1955 and 2002 (all differences are statistically significant).

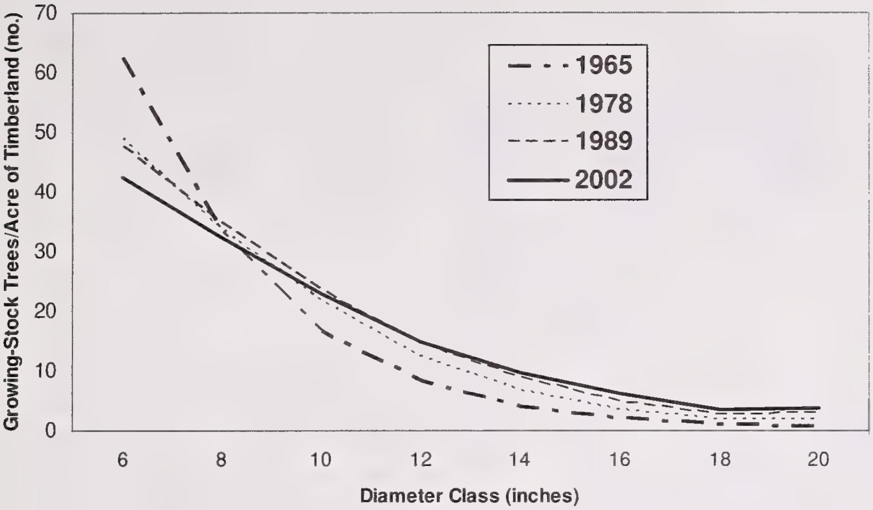

Figure 7.—Distribution of growing-stock trees (5.0 inches and larger) per acre of timberland, Pennsylvania, 1965, 1978, 1989, and 2002.

by a decrease in sapling-seedling stands and an increase in sawtimber stands. Stand-size classes are not strictly defined by age but do indicate broad stages of stand development (successional stage). Sapling-seedling stands are young, early successional stands while sawtimber stands are older stands that are approaching financial maturity. The decrease in the sapling-seedling class is of concern because this is a long-term and negative trend. Since 1955, the area of sapling-seedling stands decreased by well over 50 percent. The situation bears close monitoring because of potential adverse impacts on a variety of wildlife species that depend on young successional stands. Less forest land is entering the poletimber class compared to land moving into the sawtimber class. Sawtimber stands have more than doubled in area since 1955.

Stand Structure

The distribution of live trees by various measures is a valuable indicator of broad structural changes that are occurring in Pennsylvania's forests. Data on numbers of trees per acre should be examined without relating specific numbers to known silvicultural standards for various cover types because the FIA results represent averages for the entire State. As such, they should be reviewed for relative changes over time and within species and size classes.

In Figure 7, the broad changes in the numbers of growing-stock trees by diameter class (the stand table) are depicted for all previous inventories except the 1955 inventory. The sharp rotation of the stock table between 1965 and 1975 illustrates a dramatic shift toward larger trees. The stand table then continues to shift but at a slower rate. The most recent changes suggest a gradual but steady shift toward larger sawtimber-size trees, particularly in the larger classes.

These most recent changes also are reflected in Figure 8, which shows the distribution of all live trees down to the 2-inch diameter class. Note that the apparent increase in the number of trees in this class is not statistically significant. A closer examination of the results reveals that most of the prospective increases in 2-inch trees are heavily influenced by increases in 2-inch black birch trees (Fig. 9). Red maple, sugar maple, and eastern hemlock appear to be experiencing decreases in 2-inch trees. Numbers of 2-inch oaks showed little change.

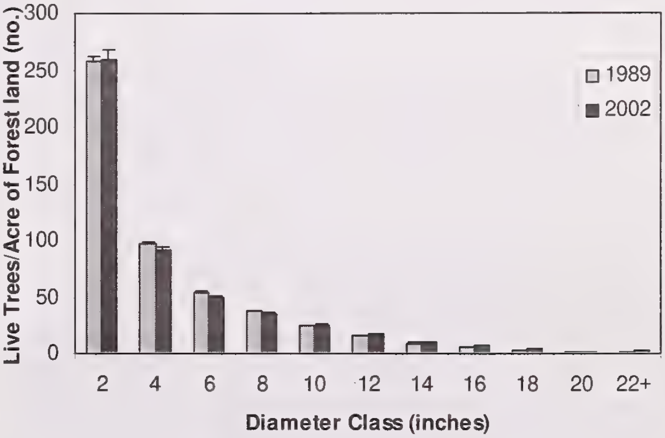

Figure 8.—Distribution of live trees per acre (1.0 inch and larger) of forest land by diameter class, Pennsylvania, 1989 and 2002 (error bars reflect 67-percent confidence interval).

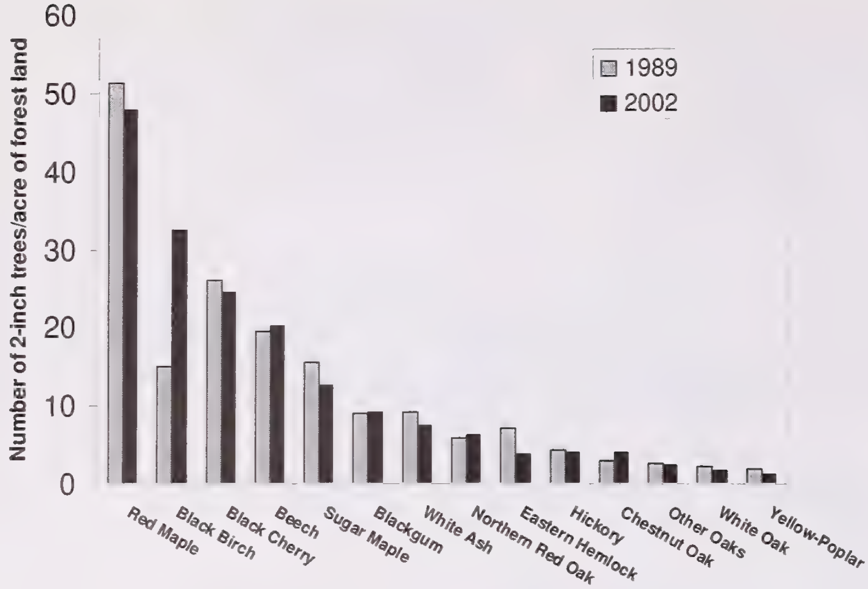

Figure 9.—Number of 2-inch live trees per acre of forest land for selected species, Pennsylvania, 1989 and 2002.

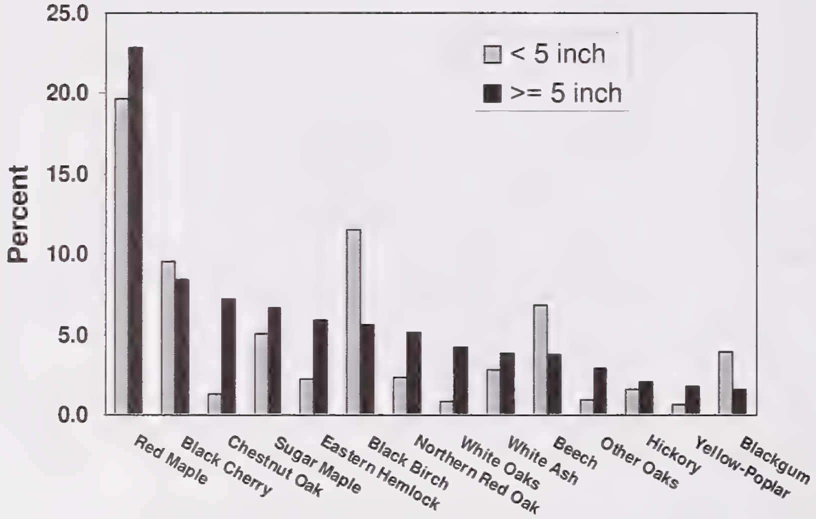

Figure 10.—Percent of trees on forest land by broad diameter class and ranked by overstory percent, Pennsylvania, 2002.

Another way to view the structural changes is to examine the percentage of small versus large stems. Figure 10 compares the relative percentage of trees less than 5.0 inches in diameter to trees more than 5.0 inches, i.e., overstory and understory trees, respectively. Species/species groups that have higher abundance in the understory than the overstory are black cherry, Black birch, beech, and blackgum. Species/species groups that exhibit higher abundance in the overstory compared to the understory are red maple, chestnut oak, sugar maple, eastern hemlock, northern red oak, white oak, white ash, other oaks, hickory, and yellow-poplar.

Inventory Volume

As mentioned earlier, the depth of the analysis of change in volume will be limited during the early years of the annual inventory. Net change in inventory volume expressed in cubic and board feet for the top species will highlight the more salient trends. The sound-wood volume of live trees includes growing-stock, rough-cull, and rotten-cull trees. The total volume of live trees on forest land increased from 27.5 to 33.7 billion cubic feet, a 23-percent increase between 1989 and 2002. Inventory volume increased for both softwoods and hardwoods. Changes in the volume of growing-stock trees on timberland, depicted in Figure 11, illustrate changes in inventory since 1955 (only the inventory of growing-stock trees on timberland is available for the early inventories). Long-term historical increases continue but at a slightly slower rate than in the past.

Examining the top 10 tree species in Pennsylvania offers additional insight into volume trends (Fig. 12). Based on

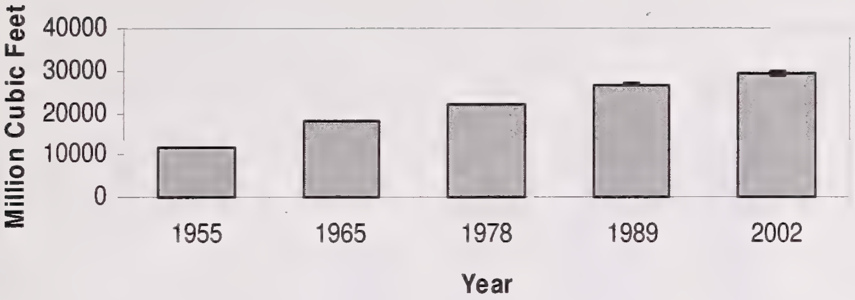

Figure 11.—Volume of growing stock on timberland by inventory date, Pennsylvania, 1955, 1965, 1978, 1989, and 2002 (all differences between bars are statistically significant at the 67-percent level).

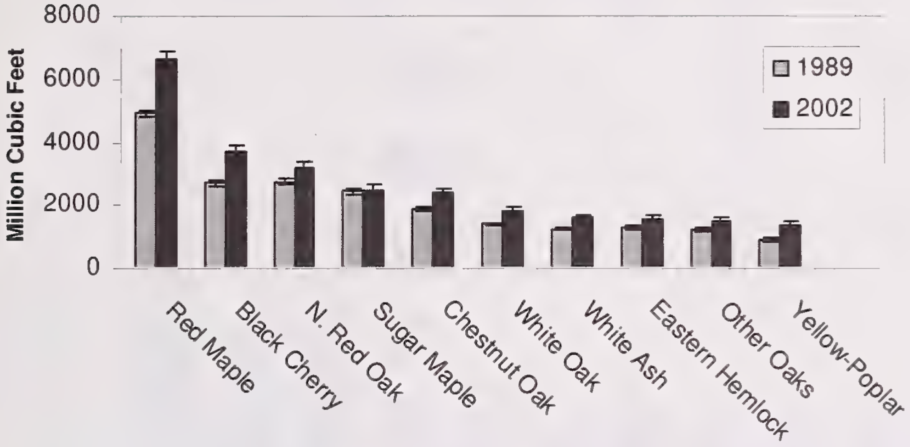

Figure 12.—Volume of live trees on forest land and 10 most abundant species, Pennsylvania, 1989 and 2002 (error bars reflect 67-percent confidence interval).

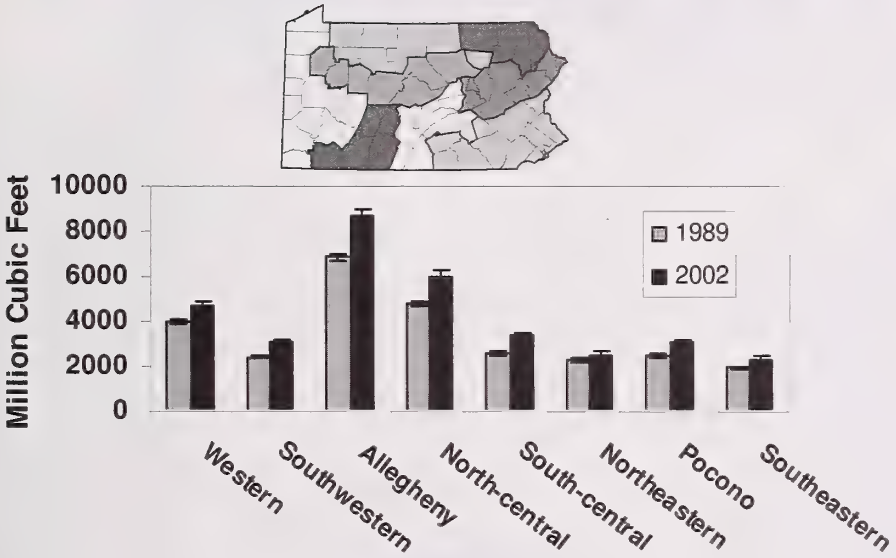

Figure 13.—Volume of live trees on forest land by inventory region, Pennsylvania, 1989 and 2002 (error bars reflect 67-percent confidence interval).

the sound-wood volume of live trees on forest land, they include red maple, black cherry, northern red oak, sugar maple, chestnut oak, white oak, white ash, eastern hemlock, other oaks, and yellow-poplar. Currently, red maple makes up 20 percent of the total volume of live trees in the State. It is interesting that the top 5 tree species account for more than half of the inventory volume and the top 10 account for 78 percent of the total volume. Increases were significant for 9 of the top 10 species (the exception was sugar maple). Increases in red maple volume continue to outpace other species/species groups. The largest increases in inventory volume have occurred in the northern-tier inventory regions (Fig. 13); however, all regions had significant increases in inventory volume. Examining several top species with relatively low sampling errors reveals large increases in red maple and black cherry inventory in northern-tier regions and elsewhere (Fig. 14). Although not as large, the volume of northern red oak increased significantly in the Allegheny, North-Central, and Southeastern regions.

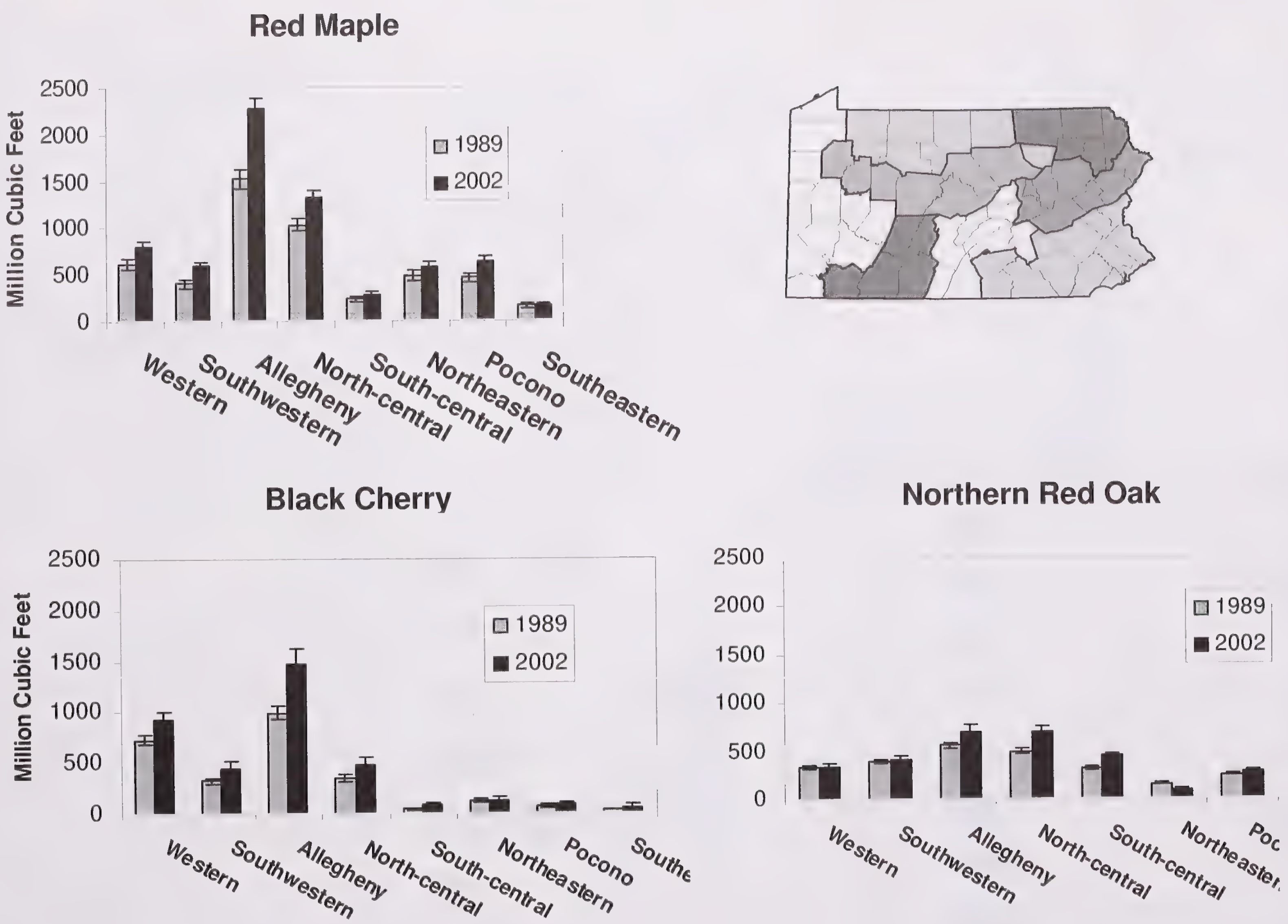

Figure 14.—Volume of live red maple, black cherry, and northern red oak trees on forest land by inventory region, Pennsylvania, 1989 and 2002 (error bars reflect 67-percent confidence interval).

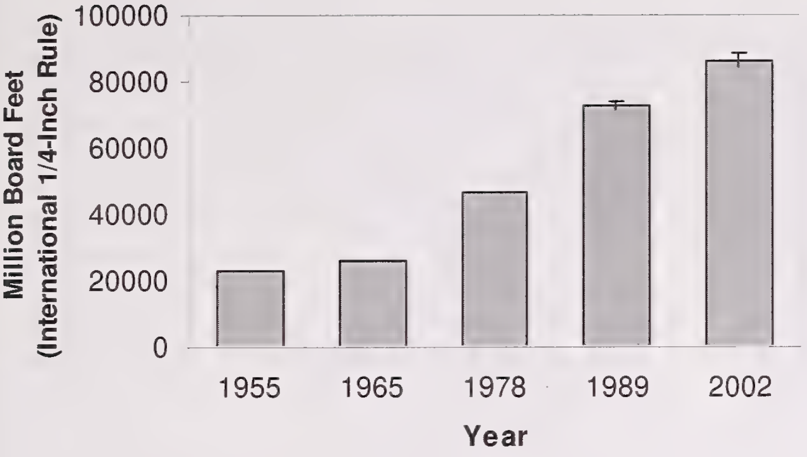

Figure 15.—Volume of sawtimber on timberland by inventory date, Pennsylvania, 1955, 1965, 1978, 1989, and 2002 (all differences between bars are statistically significant at the 67-percent level).

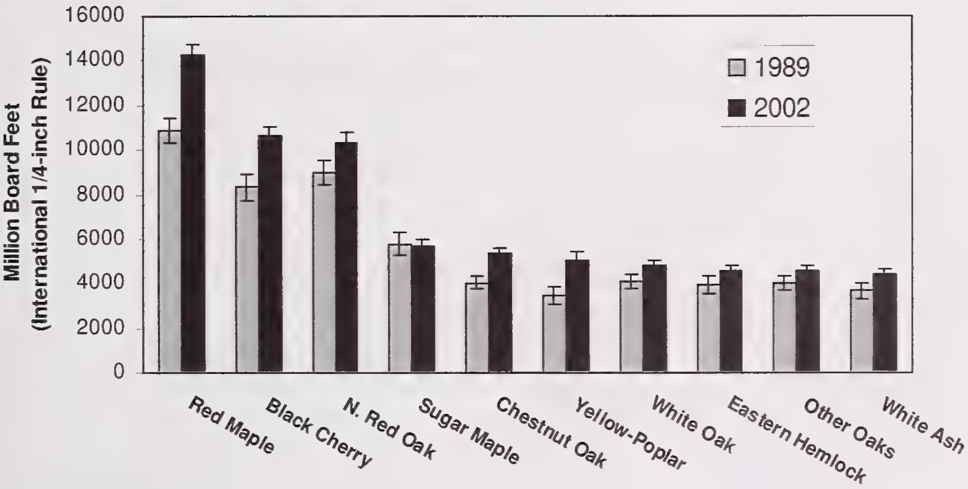

Figure 16.—Volume of sawtimber on forest land, ten most abundant species, Pennsylvania, 1989 and 2002 (error bars reflect 67-percent confidence interval).

The results for sawtimber volume also are positive. The total volume of sawtimber on timberland increased from 72.8 billion board feet (International ¼-inch rule) in 1989 to 86.3 billion board feet in 2002, an increase of 18 percent. Increases were noted for both softwoods and hardwoods. The buildup in sawtimber volume over time is shown in Figure 15. Increases are clearly evident, but at a slower rate than in the two previous inventory periods. Again, except for sugar maple, Pennsylvania's top 10 tree species increased in sawtimber volume (Fig. 16). Yellow-poplar had the largest increase on a percentage basis (65 percent).

Advance Regeneration

Studies have shown that advance regeneration often is absent in stands across Pennsylvania and that oak regeneration is especially rare (McWilliams and others 1995a, b). With over half the State's forest land in sawtimber stands, regeneration is the pressing issue in discussions about the long-term sustainability of Pennsylvania's forests.

Analysis of tree regeneration requires a series of assumptions with respect to factors affecting understory development. These include degree of seedling establishment, species composition, competitive status, and stocking levels. The approach we used gauges levels of advance tree-seedling and sapling regeneration (ATSSR). Incorporating larger trees within the existing forest canopy affects the results but detracts from the focus on the important components of the understory. Also, it was found that larger trees have a minor impact on the results.

The PRS samples all "established" tree seedlings at least 2 inches tall. Degree of establishment is checked to ensure that only second-year and older seedlings are tallied. In addition, the root collars of large-seeded species, such as the oaks, are classified as established (root-collar diameter at least 0.20 inch) or "competitive" (root-collar diameter greater than 0.75 inch). Competitive seedlings generally are considered as future canopy dominants.

The composition of ATSSR has a direct impact on the future composition of the forest overstory (Marquis and others 1994). To cover the range of future forest character and client needs, two composition groupings are used. The first groups tree species by preference for timber management. Desirable species include those favored in silvicultural activities aimed at a marketable species mix; Other Commercial species are associated with custodial management; and Other Woody species reflect overall site occupancy. The second composition grouping represents the forest's ability to regenerate the existing dominant canopy. Dominant species include those that contribute at least 2 percent of the State's total-tree biomass and are able to grow into the existing canopy; Other High Canopy species includes all others that are capable of attaining canopy dominance. This grouping also includes Other Woody species.

The competitive status of seedlings and saplings were evaluated using guidelines adapted from the work of Marquis and others (1994) to fit conditions across Pennsylvania. The guidelines weight samples according to tree height and the number of stems sampled (McWilliams and others 2002b). For example, a 6 inch -tall seedling is assigned a weight of one and a 5- to 10-foot seedling is assigned a weight of 50. Two levels of stocking were used to reflect a range of deer impact. High-deer impact reflects stocking requirements for high populations, or a minimum of 100 seedlings per 6.8 foot-radius microplot; moderate-deer impact requires at least 25 seedlings per microplot. Regeneration samples were filtered to include only those stands in the range of overall stand stocking with sufficient light for seedling establishment and development, or 40- to 75-percent stocked.

The following shows the percent of forested regeneration samples that satisfied ATSSR criteria, for composition grouping and ecoregion, for high and moderate deer impact (assumes stocking of 40 to 75 percent):

Species grouping and deer impact	State	Western Broadleaf	Plateau	Central Appalachians	Eastern Broadleaf
			TIMBER MANAGEMENT		
High deer impact:					
Desirable	36.4	44.2	27.8	37.2	36.5
Other Commercial	50.1	51.3	43.5	53.8	54.5
Other Woody	56.6	61.1	47.7	59.7	63.6
Moderate deer impact:					
Desirable	51.9	57.5	49.4	49.7	54.5
Other Commercial	63.6	62.8	62.4	64.7	68.2
Other Woody	70.6	72.6	67.1	71.6	72.7
			CANOPY DOMINANCE		
High deer impact:					
Dominant	44.2	46.0	40.5	45.0	54.5
Other High Canopy	50.3	52.7	42.6	54.1	54.5
Other Woody	56.5	61.9	46.8	59.4	63.6
Moderate deer impact:					
Dominant	60.2	59.3	63.3	58.1	68.2
Other High Canopy	65.3	65.0	65.0	65.6	68.2
Other Woody	71.4	73.5	68.8	71.9	72.7

Note: Standard errors are: State (1.7), Western Broadleaf (3.1), Plateau (3.2), Central Appalachians (2.8), and Eastern Broadleaf (10.7).

The choice of regeneration indicators is complicated by the broad spectrum of client perspectives regarding what constitutes "acceptable" regeneration. The approach used in this report was to develop a set of indicators that address as wide a spectrum of needs as possible. For example, clients with a conservative economic perspective likely would use results based on the Timber Management-Desirable species indicator. For this indicator, 36 to 52 percent of the samples satisfied ATSSR criteria for high and moderate deer impact, respectively. At the opposite extreme is the view that any tree cover is acceptable, i.e., the Canopy Dominance-Other Woody indicator. Statewide, 56 to 71 percent of the samples satisfied ATSSR criteria for this indicator. It should be noted that forests regenerating to low canopy would provide soil stability and habitat for some wildlife species, but offer little of the economic, ecological, or aesthetic appeal usually associated with forest cover.

To facilitate the comparison of results for Pennsylvania's ecoregions, it is useful to use an indicator that represents the middle ground. The Canopy Dominance indicator, which includes all species capable of achieving high canopy, is useful for this purpose. Statewide, 50 to 65 percent of the samples satisfied the ATSSR criteria for high and moderate deer populations for this indicator. Although the results are not widely divergent by ecoregion, samples in the Plateau region had the poorest satisfaction rate (43 to 65 percent). Samples with the highest rates were located in the Eastern Broadleaf region (54 to 68 percent). These results coincide with deer populations and alternate food sources common in these regions.

Regardless of the perspective one takes, it is clear that the regeneration picture in Pennsylvania is bleak on the basis of the first 2 years of data. Despite some variation across the State, the regeneration problem is ubiquitous rather than specific to a particular region, owner, or forest type.

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Glossary

Accretion. The estimated net growth on growing-stock trees that were measured during the previous inventory (divided by the number of growing seasons between surveys to produce average annual accretion). It does not include the growth on trees that were cut during the period, nor those trees that died.

Board foot. A unit of lumber measurement 1 foot long, 1 foot wide, and 1 inch thick, or its equivalent. International ¼ inch rule is used as the USDA Forest Service standard log rule in the eastern United States.

Commercial species. Tree species currently or prospectively suitable for industrial wood products; excludes species of typically small size, poor form, or inferior quality, such as hawthorn and sumac.

Condition. A classification of a land area based on land use, forest type, stand size, regeneration status, reserved status, tree density, and owner class.

Cropland. Land that currently supports agricultural crops including silage and feed grains, bare farm fields resulting from cultivation or harvest, and maintained orchards. Includes cropland used for cover crops and soil improvement.

Cull tree. A rough tree or a rotten tree.

Diameter at breast height (d.b.h.). The diameter outside bark of a standing tree measured at 4-1/2 feet above the ground.

Dry ton. A unit of measure of dry weight equivalent to 2,000 pounds or 907.1848 kilograms.

Dry weight. The weight of wood and bark as it would be if it had been oven-dried; usually expressed in pounds or tons.

Forest land. Land that is at least 10 percent stocked with trees of any size, or that formerly had such tree cover and is not currently developed for a nonforest use. The minimum area for classification of forest land is one acre. The components that make up forest land are timberland and all noncommercial forest land (see definitions).

Forest type. A classification of forest land based on the species that form a plurality of live-tree stocking.

Forest-type group. A classification of forest land based on the species forming a plurality of live-tree stocking. A combination of forest types that share closely associated species or site requirements are combined into the following major forest-type groups (the descriptions apply to forests in this state):

a. White/red pine. Forests in which eastern white pine, red pine, or eastern hemlock, singly or in combination, make up the plurality of the stocking; common associates include red maple, oak, sugar maple, and aspen.

b. Spruce/fir. Forests in which red, white, black, or Norway spruces, balsam fir, northern white-cedar, tamarack, or planted larch, singly or in combination, make up a plurality of the stocking; common associates include white pine, red maple, yellow birch, and aspens.

c. Hard pine (also called loblolly/shortleaf pine). Forests in which eastern redcedar or pitch pine, singly or in combination, make up a plurality of the stocking; common associates include white pine, paper birch, sugar maple, and basswood.

d. Oak/pine. Forests in which hardwoods (usually hickory or upland oaks) make up a plurality of the stocking and in which pines or eastern redcedar contribute 25 to 50 percent of the stocking.

e. Oak/hickory (Mixed Oak). Forests in which upland oaks, hickory, yellow-poplar, black locust, sweetgum, or red maple (when associated with central hardwoods), singly or in combination, make up a plurality of the stocking and in which pines or eastern redcedar make up less than 25 percent of the stocking; common associates include white ash, sugar maple, and hemlock.

f. Oak/gum/cypress. Bottomland forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, make up a plurality of the stocking and in which pines make up less than 25 percent of the stocking; common associates include cottonwood, willow, ash, elm, hackberry, and maple.

g. Elm/ash/red maple (also called elm /ash / cottonwood). Forests in which elm, willow, cottonwood, or red maple (when growing on wet sites), singly or in combination, make up a plurality of the stocking; common associates include white ash, sugar maple, aspens, and oaks.

h. Northern hardwoods (also called maple/beech/birch). Forests in which sugar maple, beech, yellow birch, black cherry, or red maple (when associated with northern hardwoods), singly or in combination, make up a plurality of the stocking; common associates include white ash, eastern hemlock, basswood, aspens, and red oak.

i. Aspen/birch. Forests in which aspen, paper birch, or gray birch, singly or in combination, make up a plurality of the stocking; common associates include red maple, white pine, red oaks, and white ash.

Gross growth. The sum of accretion and ingrowth.

Growing-stock trees. Live trees of commercial species classified as sawtimber, poletimber, saplings, or seedlings; that is, all live trees of commercial species except rough and rotten trees.

Growing-stock volume. Net volume, in cubic feet, of growing-stock trees 5.0 inches d.b.h. and larger from a 1-foot stump to a minimum 4.0-inch top diameter outside bark of the central stem, or to the point where the central stem breaks into limbs. Net volume equals gross volume less deduction for cull.

Hardwoods. Dicotyledonous trees, usually broad-leaved and deciduous.

Ingrowth. The estimated net volume of growing-stock trees that became 5.0 inches d.b.h. or larger during the period between inventories (divided by the number of growing seasons between surveys to produce average annual ingrowth). Also, the estimated net volume of growing-stock trees 5.0 inches d.b.h. and larger that are growing on land that was reclassified from noncommercial forest land or nonforest land to timberland.

International 1/4-inch rule. A log rule or formula for estimating the board-foot volume of logs. The mathematical formula is:

Board-foot volume = (0.22D2 - 0.71D)(0.904762)

for 4-foot sections, where D=diameter inside bark at the small end of the log section. This rule is used as the USDA Forest Service standard log rule in the Eastern United States.

Land area. (a) Bureau of Census: The area of dry land and land temporarily or partly covered by water, such as marshes, swamps, and river flood plains; streams, sloughs, estuaries, and canals less than 200 feet wide; and lakes, reservoirs, and ponds less than 4.5 acres in area. (b) Forest Inventory and Analysis: same as (a) except that the minimum width of streams, etc. is 120 feet, and the minimum size of lakes, etc. is 1 acre.

Land use. A classification of land that indicates the primary use at the time of inventory. Major categories are forest land and nonforest land.

Live tree. Growing stock, rough, and rotten trees.

Merchantable stem. The main stem of the tree between a 1-foot stump height and a 4-inch top diameter (outside the bark), including the wood and bark.

Mortality. The estimated net volume of growing-stock trees at the previous inventory that died from natural causes before the current inventory (divided by the number of growing seasons between surveys to produce average annual mortality) .

Net change. The difference between the current and previous inventory estimates of growing-stock volume (divided by the number of growing seasons between surveys to produce average annual net change). Components of net change are ingrowth plus accretion, minus mortality, minus cull increment, plus cull decrement, minus removals.

Net dry weight. The dry weight of woody material less the weight of all unsound (rotten) material.

Net growth. The change, resulting from natural causes, in growing-stock volume during the period between surveys (divided by the number of growing seasons to produce average annual net growth). Components of net growth are ingrowth plus accretion, minus mortality, minus cull increment, plus cull decrement.

Noncensus water. Streams/rivers between 120 feet and 200 feet in width, and bodies of water between 1 and 4.5 acres in size. The Bureau of the Census classifies such water as land.

Noncommercial species. Tree species of typically small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products.

Nonforest land. Land that has never supported forests, or land formerly forested but now in nonforest use such as cropland, pasture, residential areas, marshes, swamps, highways, industrial or commercial sites, or noncensus water.

Nonsalvable dead tree. A dead tree with most or all of its bark missing that is at least 5.0 inches d.b.h. and is at least 4.5 feet tall.

Nonstocked area. A stand-size class of forest land that is less than 10 percent stocked with live trees.

Pasture land. Includes any pasture land other than cropland and woodland pasture. It can include lands that have had lime fertilizer or seed applied, or that had been improved by irrigation, drainage, or control of weeds and brush.

Poletimber stand. A stand-size class of forest land that is at least 10 percent stocked with live trees of which half or more of such stocking is in poletimber or sawtimber trees or both, and in which the stocking of poletimber exceeds that of sawtimber.

Poletimber tree. A live tree of commercial species meeting regional specifications of soundness and form and at least 5.0 inches in d.b.h., but smaller than a sawtimber tree.

Relative stand density. A stocking classification procedure that reflects species, stage of development, and the characteristics of the trees present in a stand.

Removals. The net growing-stock volume harvested or killed in logging, cultural operations (such as timber stand improvement) or land clearing, and the net growing-stock volume neither harvested nor killed but growing on land that was reclassified from timberland to noncommercial forest land or nonforest land during the period between surveys. This volume is divided by the number of growing seasons to produce average annual removals.

Reserved productive forest land. Forest land sufficiently productive to qualify as timberland but withdrawn from timber utilization through statute or administrative designation; land exclusively used for Christmas tree production.

Rotten tree. A live tree of commercial species that does not contain at least one 12-foot sawlog or two noncontiguous sawlogs, each 8 feet or longer, now or prospectively, and does not meet regional specifications for freedom from defect primarily because of rot; that is, more than 50 percent of the cull volume in the tree is rotten.

Rough tree. (a)The same as a rotten tree except that a rough tree does not meet regional specifications for freedom from defect primarily because of roughness or poor form; also (b) a live tree of noncommercial species.

Salvable dead tree. A tree at least 5.0 inches d.b.h. that has died recently and still has intact bark; may be standing, fallen, windthrown, knocked down, or broken off.

Sampling error. A measure of the reliability of an estimate, expressed as a percentage of the estimate. The sampling errors given in this report correspond to one standard error and are calculated as the square root of the variance, divided by the estimate, and multiplied by 100. Indicated in statistical tables as "SE".

Sapling. All live trees 1.0 through 4.9 inches d.b.h.

Sapling/seedling stand. A stand-size class of forest land that is at least 10 percent stocked with live trees of which half or more of such stocking is in saplings or seedlings or both.

Sawlog. A log meeting regional standards of diameter, length, and freedom from defect, including a minimum 8-foot length and a minimum top diameter inside bark of 6 inches for softwoods and 8 inches for hardwoods. (See specifications under Tree-Grade Classification.)

Sawlog portion. That part of the bole of a sawtimber tree between the stump and the sawlog top.

Sawlog top. The point on the bole of a sawtimber tree above which a sawlog cannot be produced. The minimum sawlog top is 7.0 inches diameter outside bark (d.o.b.) for softwoods and 9.0 inches d.o.b. for hardwoods.

Sawtimber stand. A stand-size class of forest land that is at least 10 percent stocked with live trees of which half or more of such stocking is in poletimber or sawtimber trees or both, and in which the stocking of sawtimber is at least equal to that of poletimber.

Sawtimber tree. A live tree of commercial species at least 9.0 inches d.b.h. for softwoods or 11.0 inches for hardwoods, containing at least one 12-foot sawlog or two noncontiguous 8-foot sawlogs, and meeting regional specifications for freedom from defect.

Sawtimber volume. Net volume in board feet, by the International 1/4-inch rule, of sawlogs in sawtimber trees. Net volume equals gross volume less deductions for rot, sweep, and other defects that affect use for lumber.

SE. See Sampling error.

Seedling. A live tree less than 1.0 inch d.b.h. and at least 1 foot tall.

Snag. Standing dead tree with most or all of its bark missing that is at least 5.0 inches d.b.h. and at least 4.5 feet tall (does not include salvable dead).

Softwoods. Coniferous trees, usually evergreen and having needles or scalelike leaves.

Sound-wood volume. Tree volume of the central stem from a 1-foot stump to a minimum top diameter outside bark or a point where the stem breaks into limbs. Sound cull portions are included. Rotten cull portions are excluded. Most often expressed in cubic feet for live trees.

Stand. A group of forest trees growing on forest land.

Stand origin. An indication of how the measured stand originated: 100 percent natural, 100 percent artificial, or a combination of both.

Stand-size class. A classification of forest land based on the size class (that is, seedlings, saplings, poletimber, or sawtimber) of the stocking of all live trees in the area.

State lands. Lands owned by the state or leased to the state for 50 years or more.

Stocking. The degree of occupancy of land by trees relative to the growth potential utilized by a site. It is expressed as a percent of the "normal" value presented in yield tables and stocking quides. Two categories of stocking are used in this report: all live trees and growing-stock trees. The relationships between the classes and the percentage of the stocking standard are: nonstocked (0 to 9); poorly stocked (10 to 34); moderately stocked (35 to 59); fully stocked (60 to 100); and overstocked (greater than 100).

Stump. The main stem of a tree from ground level to 1 foot above ground level, including the wood and bark.

Timberland. Forest land producing or capable of producing crops of industrial wood (more than 20 cubic feet per acre per year) and not withdrawn from timber utilization (formerly known as commercial forest land).

Timber products. Roundwood (round timber) products and manufacturing plant by-products harvested from growing-stock trees on timberland; from other sources, such as cull trees, salvable dead trees, limbs, tops, and saplings; and from trees on noncommercial forest and nonforest lands.

Timber removals. The growing-stock or sawtimber volume of trees removed from the inventory for roundwood products, plus logging residues, volume destroyed during land clearing, and volume of standing trees on land that was reclassified from timberland to noncommercial forest land.

Top. The wood and bark of a tree above the merchantable height (or above the point on the stem 4.0 inches in diameter outside bark); generally includes the uppermost stem, branches, and twigs of the tree, but not the foliage.

Tree class. A classification of the quality or condition of trees for sawlog production. Tree class for sawtimber trees is based on their current condition. Tree class for poletimber trees is a prospective determination—a forecast of their potential quality when they reach sawtimber size (11.0 inches d.b.h. for hardwoods, 9.0 inches d.b.h. for softwoods).

Tree grade. A classification of sawtimber quality based on guidelines for tree grades for hardwoods, white pine, and southern pine. (Note: Red pine was graded using the guidelines for southern pine.)

Trees. Woody plants that have well-developed stems and that usually are more than 12 feet tall at maturity.

Unproductive forest land. Forest land that is incapable of producing 20 cubic feet per acre per year of industrial wood under natural conditions, because of adverse site conditions.

Upper-stem portion. That part of the main stem or fork of a sawtimber tree above the sawlog top to a diameter of 4.0 inches outside bark, or to the point where the main stem or fork breaks into limbs.

Veneer log or bolt. A roundwood product from which veneer is sliced or sawn that usually meets certain minimum standards of diameter, length, and defect.

Volume suitable for pulpwood. The sound volume (only rotten cull excluded) of growing-stock and rough trees.

Appendix

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Area of forest land by forest type, forest-type group, and stand-size class, Pennsylvania, 2002.

Table 3.
Area of timberland by forest type, forest-type group, and stand-size class, Pennsylvania, 2002.

Table 3. (SE)
Area of timberland by forest type, forest-type group, and stand-size class, Pennsylvania, 2002.

Table 4.
Area of timberland by forest-type group and stocking class of all live trees, Pennsylvania, 2002.

Table 4. (SE)
Area of timberland by forest-type group and stocking class of all live trees, Pennsylvania, 2002.

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Number of live trees (1.0+ inches d.b.h.) on forest land by species and diameter class, Pennsylvania, 2002.

Table 6.
Number of live trees (1.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 2002.

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Number of live trees (1.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 2002.

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Number of trees (5.0+ inches d.b.h.) on timberland by species and tree class, Pennsylvania, 2002.

Table 7. (SE)
Number of trees (5.0+ inches d.b.h.) on timberland by species and tree class, Pennsylvania, 2002.

Table 8.
Number of growing-stock trees (5.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 2002.

Table 8. (SE)
Number of growing-stock trees (5.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 2002.

Table 9.
Net volume of all trees (5.0+ inches d.b.h.) on timberland by class of timber and species group, Pennsylvania, 2002.

Table 9. (SE)
Net volume of all trees (5.0+ inches d.b.h.) on timberland by class of timber and species group, Pennsylvania, 2002.

Table 10.
Sound volume of all trees (5.0+ inches d.b.h.) on forest land by species and diameter class, Pennsylvania, 2002.

Table 10. (SE)
Sound volume of all trees (5.0+ inches d.b.h.) on forest land by species and diameter class, Pennsylvania, 2002.

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Net volume of growing-stock trees on timberland by species and forest-type group, Pennsylvania, 2002.

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Net volume of growing-stock trees on timberland by species and forest-type group, Pennsylvania, 2002.

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Net volume of sawtimber trees on timberland by species and diameter class, Pennsylvania, 1989.

Table 1.--Land area by land class, Pennsylvania, 2002[a,b,c]
(In thousands of acres)

Land class	Area		
	Acres	Percent	
Rural timberland	16,033.6	55.9	1.0
Urban timberland[d]	134.3	0.5	23.1
Total timberland	16,167.9	56.4	1.0
Reserved forest[e]	375.3	1.3	16.0
Unproductive forest	108.9	0.4	27.9
Total forest land	16,652.1	58.1	.9
Cropland	4,760.6	16.6	3.5
Pasture	1,163.2	4.1	8.4
Christmas tree plantation[f]	73.3	0.3	35.0
Noncensus water	102.3	0.4	21.0
Other	5,931.1	20.7	3.0
Total nonforest land	12,030.5	41.9	1.2
Total area[g]	28,682.6	100.0	.0
SE	.0	.0	

[a] In this and other tables, a zero indicates that the data are negligible or the condition was not encountered in the sample.

[b] Rows and columns in all tables may not sum due to rounding.

[c] All estimates are derived from 60 percent (three panels) of the plots in this cycle.

[d] Urban timberland previously classified as urban forest land (not part of the timberland estimate).

[e] Reserve lands are estimated.

[f] Christmas tree plantations previously classified as forest land.

[g] Source: U.S. Department of Commerce, Bureau of Census, 2000.

Table 2.--Area of forest land by forest type, forest-type group, and stand-size class, Pennsylvania, 2002

(In thousands of acres)

Forest type	Stand-size class				All classes	SE
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked		
Red pine	15.2	17.4	.0	.0	32.6	43.9
White pine	109.6	24.6	32.3	.0	166.5	20.8
White pine/hemlock	38.3	.0	.0	2.4	40.7	46.6
Hemlock	287.7	19.8	.0	.0	307.5	17.0
Scotch pine	6.9	36.2	29.7	.0	72.9	30.9
White/red pine group	457.8	98.0	62.0	2.4	620.1	11.3
Red spruce	.0	8.1	.0	.0	8.1	100.0
White spruce	10.0	10.8	.0	.0	20.7	70.8
Norway spruce	2.9	13.2	8.0	.0	24.1	57.3
Tamarack	5.2	9.4	.0	.0	14.6	73.6
Larch plantation	.0	15.6	11.4	.0	26.9	58.0
Spruce/fir group	18.1	57.0	19.4	.0	94.5	30.4
Shortleaf pine	.0	.0	10.3	.0	10.3	100.0
Virginia pine	36.4	24.4	.0	.0	60.8	34.8
Eastern redcedar	.0	5.6	1.8	.0	7.4	79.7
Pitch pine	33.5	.0	.0	.0	33.5	50.5
Table mountain pine	2.2	.0	.0	.0	2.2	100.0
Loblolly/shortleaf group	72.2	30.0	12.1	.0	114.2	25.8
Wh. pine/no.red oak/wh. ash	66.4	.0	1.6	.0	68.0	34.8
Virginia pine/oak	10.3	23.5	6.6	.0	40.3	45.8
Other oak/pine	25.1	9.9	.0	.0	35.0	51.1
Oak/pine group	101.7	33.4	8.2	.0	143.3	24.3
Post, black, or bear oak	62.7	.0	29.8	.0	92.6	28.2
Chestnut oak	533.3	435.0	37.4	.0	1,005.7	9.3
White oak/red oak/hickory	500.9	179.6	21.7	.0	702.2	11.3
White oak	209.4	94.5	.0	.0	303.9	17.3
Northern red oak	394.5	39.8	4.0	.0	438.3	14.2
Y-poplar/wh. oak/no.red oak	44.4	20.5	9.9	.0	74.8	35.2
Black locust	34.1	52.8	84.9	5.9	177.7	20.2
Sweetgum/yellow-poplar	7.3	.0	.0	.0	7.3	100.0
Black walnut	44.3	19.8	24.9	.0	88.9	27.5
Yellow-poplar	77.0	24.3	2.4	3.9	107.5	25.7
Hawthorn/reverting field	.0	5.6	61.5	.0	67.1	32.2
Scarlet oak	11.8	14.9	.0	.0	26.8	54.2
Sassafras/persimmon	.0	24.5	.0	.0	24.5	60.8

Table 2.-continued

(In thousands of acres)

Forest type	Stand-size class				All classes	SE
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked		
Red maple/central hardwood	211.5	232.5	31.0	.0	475.0	13.5
Mixed central hardwoods	2,521.8	1,338.3	179.1	2.9	4,042.1	4.2
Oak/hickory group	4,653.0	2,482.0	486.7	12.7	7,634.3	2.5
Black ash/Amer. elm/red maple	90.6	47.8	43.5	20.5	202.5	19.4
Red maple(lowland)	8.3	34.5	25.0	.0	67.8	34.9
Red maple(upland)	203.6	125.4	62.7	.0	391.6	14.5
River birch/sycamore	45.2	.0	4.7	10.4	60.3	37.9
Cottonwood	16.9	.0	.0	.0	16.9	71.2
Willow	16.9	1.8	12.4	4.7	35.8	46.0
Sycamore/pecan/American elm	40.5	.0	.0	2.4	42.9	43.4
American elm/green ash	3.8	18.9	11.6	.0	34.4	47.1
Elm/ash/red maple group	425.7	228.3	160.0	38.0	852.1	9.7
Sugar maple/beech/yellow birch	1,546.5	361.0	33.3	.0	1,940.9	6.3
Black cherry	472.3	404.6	328.3	27.9	1,233.2	7.9
Red maple/northern hardwoods	875.1	526.4	154.2	19.4	1,575.0	7.1
Pin cherry/reverting field	.0	73.1	169.4	.0	242.5	18.6
Mixed northern hardwoods	965.4	643.8	234.8	.0	1,844.0	6.6
Northern hardwoods group	3,859.3	2,009.0	920.0	47.4	6,835.6	2.7
Aspen	25.3	116.0	149.8	7.2	298.2	16.4
Paper birch	7.6	10.0	.0	.0	17.6	62.4
Gray birch	.0	.0	32.2	.0	32.2	49.5
Aspen/birch group	32.9	125.9	182.0	7.2	348.0	15.1
Nonstocked	.0	.0	.0	10.0	10.0	100.0
All forest types	9,620.8	5,063.5	1,850.3	117.5	16,652.1	.9
SE	2.1	3.6	6.5	24.0	.9	

Table 2. (SE).--Area of forest land by forest type, forest-type group, and stand-size class, Pennsylvania, 2002
(Standard error as percentage of total)

Forest type	Stand-size class				All classes
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked	
Red pine	61.1	62.6	.0	.0	43.9
White pine	25.3	53.1	51.2	.0	20.8
White pine/hemlock	49.1	.0	.0	100.0	46.6
Hemlock	17.6	70.6	.0	.0	17.0
Scotch pine	58.0	41.0	55.4	.0	30.9
White/red pine group	13.3	27.0	37.6	100.0	11.3
Red spruce	.0	100.0	.0	.0	100.0
White spruce	100.0	100.0	.0	.0	70.8
Norway spruce	100.0	83.6	97.6	.0	57.3
Tamarack	100.0	100.0	.0	.0	73.6
Larch plantation	.0	68.7	100.0	.0	58.0
Spruce/fir group	64.1	39.2	71.3	.0	30.4
Shortleaf pine	.0	.0	100.0	.0	100.0
Virginia pine	45.9	53.1	.0	.0	34.8
Eastern redcedar	.0	100.0	100.0	.0	79.7
Pitch pine	50.5	.0	.0	.0	50.5
Table mountain pine	100.0	.0	.0	.0	100.0
Loblolly/shortleaf group	33.1	47.1	86.5	.0	25.8
Wh. pine/no.red oak/wh. ash	35.6	.0	100.0	.0	34.8
Virginia pine/oak	100.0	59.3	100.0	.0	45.8
Other oak/pine	59.4	100.0	.0	.0	51.1
Oak/pine group	29.2	51.2	82.8	.0	24.3
Post, black, or bear oak	34.3	.0	49.8	.0	28.2
Chestnut oak	13.1	14.6	50.9	.0	9.3
White oak/red oak/hickory	13.5	22.8	63.2	.0	11.3
White oak	20.6	31.4	.0	.0	17.3
Northern red oak	15.2	41.0	74.0	.0	14.2
Y-poplar/wh. oak/no.red oak	44.4	70.8	100.0	.0	35.2
Black locust	48.3	35.1	30.1	71.1	20.2
Sweetgum/yellow-poplar	100.0	.0	.0	.0	100.0
Black walnut	37.4	54.5	58.1	.0	27.5
Yellow-poplar	31.4	54.2	100.0	100.0	25.7
Hawthorn/reverting field	.0	100.0	33.9	.0	32.2
Scarlet oak	82.1	72.2	.0	.0	54.2
Sassafras/persimmon	.0	60.8	.0	.0	60.8

Table 2. (SE).-continued

(Standard error as percentage of total)

Forest type	Stand-size class				All classes
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked	
Red maple/central hardwood	20.2	19.6	54.3	.0	13.5
Mixed central hardwoods	5.6	8.0	22.2	100.0	4.2
Oak/hickory group	3.7	5.5	13.0	63.0	2.5
Black ash/Amer. elm/red maple	30.1	35.3	40.4	70.7	19.4
Red maple(lowland)	100.0	48.9	57.9	.0	34.9
Red maple(upland)	20.4	25.7	35.8	.0	14.5
River birch/sycamore	43.8	.0	100.0	100.0	37.9
Cottonwood	71.2	.0	.0	.0	71.2
Willow	71.1	100.0	81.6	100.0	46.0
Sycamore/pecan/American elm	45.7	.0	.0	100.0	43.4
American elm/green ash	100.0	63.5	82.2	.0	47.1
Elm/ash/red maple group	14.1	18.2	22.1	49.0	9.7
Sugar maple/beech/yellow birch	7.3	15.7	50.4	.0	6.3
Black cherry	13.6	13.6	16.0	43.0	7.9
Red maple/northern hardwoods	9.8	13.1	23.0	45.7	7.1
Pin cherry/reverting field	.0	35.7	21.9	.0	18.6
Mixed northern hardwoods	9.4	11.5	19.5	.0	6.6
Northern hardwoods group	4.1	6.2	9.4	31.5	2.7
Aspen	57.6	26.3	23.7	73.1	16.4
Paper birch	100.0	79.1	.0	.0	62.4
Gray birch	.0	.0	49.5	.0	49.5
Aspen/birch group	49.9	25.0	21.4	73.1	15.1
Nonstocked	.0	.0	.0	100.0	100.0
All forest types	2.1	3.6	6.5	24.0	.9

Table 3.--Area of timberland by forest type, forest-type group, and stand-size class, Pennsylvania, 2002

(In thousands of acres)

Forest type	Stand-size class				All classes	SE
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked		
Red pine	15.2	17.4	.0	.0	32.6	43.9
White pine	109.6	24.6	32.3	.0	166.5	20.8
White pine/hemlock	38.3	.0	.0	2.4	40.7	46.6
Hemlock	287.7	19.8	.0	.0	307.5	17.0
Scotch pine	6.9	36.2	29.7	.0	72.9	30.9
White/red pine group	457.8	98.0	62.0	2.4	620.1	11.3
Red spruce	.0	8.1	.0	.0	8.1	100.0
White spruce	.0	10.8	.0	.0	10.8	100.0
Norway spruce	2.9	13.2	8.0	.0	24.1	57.3
Tamarack	5.2	9.4	.0	.0	14.6	73.6
Larch plantation	.0	15.6	11.4	.0	26.9	58.0
Spruce/fir group	8.2	57.0	19.4	.0	84.5	31.9
Shortleaf pine	.0	.0	10.3	.0	10.3	100.0
Virginia pine	36.4	24.4	.0	.0	60.8	34.8
Eastern redcedar	.0	5.6	1.8	.0	7.4	79.7
Pitch pine	33.5	.0	.0	.0	33.5	50.5
Table mountain pine	2.2	.0	.0	.0	2.2	100.0
Loblolly/shortleaf group	72.2	30.0	12.1	.0	114.2	25.8
Wh. pine/no.red oak/wh. ash	66.4	.0	1.6	.0	68.0	34.8
Virginia pine/oak	10.3	23.5	6.6	.0	40.3	45.8
Other oak/pine	25.1	9.9	.0	.0	35.0	51.1
Oak/pine group	101.7	33.4	8.2	.0	143.3	24.3
Post, black, or bear oak	62.7	.0	20.2	.0	83.0	30.1
Chestnut oak	516.0	414.8	37.4	.0	968.2	9.5
White oak/red oak/hickory	472.3	179.6	21.7	.0	673.6	11.6
White oak	199.4	87.3	.0	.0	286.7	17.7
Northern red oak	365.2	39.8	4.0	.0	409.0	14.7
Y-poplar/wh. oak/no.red oak	44.4	20.5	9.9	.0	74.8	35.2
Black locust	34.1	52.8	83.3	5.9	176.1	20.4
Black walnut	44.3	17.4	24.9	.0	86.5	28.1
Yellow-poplar	77.0	24.3	2.4	3.9	107.5	25.7
Hawthorn/reverting field	.0	5.6	46.4	.0	52.0	36.1
Scarlet oak	11.8	14.9	.0	.0	26.8	54.2
Sassafras/persimmon	.0	24.5	.0	.0	24.5	60.8
Red maple/central hardwood	202.0	232.5	31.0	.0	465.5	13.6

Table 3.-continued

(In thousands of acres)

Forest type	Stand-size class				All classes	SE
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked		
Mixed central hardwoods	2,474.5	1,318.1	168.6	2.9	3,964.1	4.2
Oak/hickory group	4,503.7	2,432.0	450.0	12.7	7,398.3	2.6
Black ash/Amer. elm/red maple	90.6	33.7	43.5	20.5	188.4	20.2
Red maple(lowland)	8.3	24.3	12.3	.0	44.9	41.7
Red maple(upland)	192.8	125.4	62.7	.0	380.8	14.7
River birch/sycamore	45.2	.0	4.7	.0	49.9	40.8
Cottonwood	16.9	.0	.0	.0	16.9	71.2
Willow	16.9	1.8	12.2	.0	30.9	51.1
Sycamore/pecan/American elm	40.5	.0	.0	2.4	42.9	43.4
American elm/green ash	3.8	18.9	11.6	.0	34.4	47.1
Elm/ash/red maple group	415.0	204.1	147.0	22.9	789.1	10.0
Sugar maple/beech/yellow birch	1,505.8	351.1	33.3	.0	1,890.3	6.4
Black cherry	462.3	404.6	311.7	27.9	1,206.7	8.0
Red maple/northern hardwoods	865.3	515.4	154.2	19.4	1,554.2	7.2
Pin cherry/reverting field	.0	70.5	169.4	.0	239.8	18.8
Mixed northern hardwoods	945.2	614.0	234.8	.0	1,794.0	6.7
Northern hardwoods group	3,778.6	1,955.7	903.4	47.4	6,685.1	2.8
Aspen	25.3	106.2	144.9	7.2	283.5	16.7
Paper birch	7.6	10.0	.0	.0	17.6	62.4
Gray birch	.0	.0	32.2	.0	32.2	49.5
Aspen/birch group	32.9	116.1	177.1	7.2	333.3	15.3
All forest types	9,370.1	4,926.2	1,779.1	92.5	16,167.9	1.0
SE	2.1	3.7	6.6	25.8	1.0	

Table 3 (SE).--Area of timberland by forest type, forest-type group, and stand-size class, Pennsylvania, 2002

(Standard error as percentage of total)

Forest type	Stand-size class				All classes
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked	
Red pine	61.1	62.6	.0	.0	43.9
White pine	25.3	53.1	51.2	.0	20.8
White pine/hemlock	49.1	.0	.0	100.0	46.6
Hemlock	17.6	70.6	.0	.0	17.0
Scotch pine	58.0	41.0	55.4	.0	30.9
White/red pine group	13.3	27.0	37.6	100.0	11.3
Red spruce	.0	100.0	.0	.0	100.0
White spruce	.0	100.0	.0	.0	100.0
Norway spruce	100.0	83.6	97.6	.0	57.3
Tamarack	100.0	100.0	.0	.0	73.6
Larch plantation	.0	68.7	100.0	.0	58.0
Spruce/fir group	73.4	39.2	71.3	.0	31.9
Shortleaf pine	.0	.0	100.0	.0	100.0
Virginia pine	45.9	53.1	.0	.0	34.8
Eastern redcedar	.0	100.0	100.0	.0	79.7
Pitch pine	50.5	.0	.0	.0	50.5
Table mountain pine	100.0	.0	.0	.0	100.0
Loblolly/shortleaf group	33.1	47.1	86.5	.0	25.8
Wh. pine/no.red oak/wh. ash	35.6	.0	100.0	.0	34.8
Virginia pine/oak	100.0	59.3	100.0	.0	45.8
Other oak/pine	59.4	100.0	.0	.0	51.1
Oak/pine group	29.2	51.2	82.8	.0	24.3
Post, black, or bear oak	34.3	.0	63.4	.0	30.1
Chestnut oak	13.3	14.9	50.9	.0	9.5
White oak/red oak/hickory	13.9	22.8	63.2	.0	11.6
White oak	21.1	33.0	.0	.0	17.7
Northern red oak	15.8	41.0	74.0	.0	14.7
Y-poplar/wh. oak/no.red oak	44.4	70.8	100.0	.0	35.2
Black locust	48.3	35.1	30.6	71.1	20.4
Black walnut	37.4	60.5	58.1	.0	28.1
Yellow-poplar	31.4	54.2	100.0	100.0	25.7
Hawthorn/reverting field	.0	100.0	38.6	.0	36.1
Scarlet oak	82.1	72.2	.0	.0	54.2
Sassafras/persimmon	.0	60.8	.0	.0	60.8
Red maple/central hardwood	20.7	19.6	54.3	.0	13.6

Table 3 (SE).-continued

(Standard error as percentage of total)

Forest type	Stand-size class				All classes
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked	
Mixed central hardwoods	5.7	8.1	22.8	100.0	4.2
Oak/hickory group	3.8	5.6	13.6	63.0	2.6
Black ash/Amer. elm/red maple	30.1	40.6	40.4	70.7	20.2
Red maple(lowland)	100.0	55.4	81.6	.0	41.7
Red maple(upland)	20.8	25.7	35.8	.0	14.7
River birch/sycamore	43.8	.0	100.0	.0	40.8
Cottonwood	71.2	.0	.0	.0	71.2
Willow	71.1	100.0	82.9	.0	51.1
Sycamore/pecan/American elm	45.7	.0	.0	100.0	43.4
American elm/green ash	100.0	63.5	82.2	.0	47.1
Elm/ash/red maple group	14.2	19.2	22.9	64.2	10.0
Sugar maple/beech/yellow birch	7.4	15.8	50.4	.0	6.4
Black cherry	13.7	13.6	16.4	43.0	8.0
Red maple/northern hardwoods	9.8	13.2	23.0	45.7	7.2
Pin cherry/reverting field	.0	36.9	21.9	.0	18.8
Mixed northern hardwoods	9.5	11.7	19.5	.0	6.7
Northern hardwoods group	4.2	6.3	9.5	31.5	2.8
Aspen	57.6	27.2	23.7	73.1	16.7
Paper birch	100.0	79.1	.0	.0	62.4
Gray birch	.0	.0	49.5	.0	49.5
Aspen/birch group	49.9	25.8	21.4	73.1	15.3
All forest types	2.1	3.7	6.6	25.8	1.0

Table 4.--Area of timberland by forest-type group and stocking class of all live trees, Pennsylvania, 2002

(In thousands of acres)

Forest-type group	Stocking class: Nonstocked	Poorly stocked	Moderately stocked	Fully stocked	Over-stocked	All classes	SE
White/red pine	2.4	63.0	163.8	296.3	94.6	620.1	11.3
Spruce/fir	.0	16.4	46.0	21.9	.2	84.5	31.9
Loblolly/shortleaf	.0	5.6	63.1	45.5	.0	114.2	25.8
Oak/pine	.0	25.3	15.6	99.9	2.6	143.3	24.3
Oak/hickory	12.7	410.6	2,490.7	4,144.2	340.0	7,398.3	2.6
Elm/ash/red maple	22.9	140.5	301.4	263.7	60.5	789.1	10.0
Northern hardwoods	47.4	544.6	2,238.0	3,407.0	448.1	6,685.1	2.8
Aspen/ birch	7.2	32.1	139.5	104.8	49.7	333.3	15.3
Total	92.5	1,238.1	5,458.3	8,383.3	995.8	16,167.9	1.0
SE	25.8	7.9	3.4	2.4	8.7	1.0	

Table 4 (SE).--Area of timberland by forest-type group and stocking class of all live trees, Pennsylvania, 2002

(Standard error as percentage of total)

Forest-type group	Stocking class					All classes
	Nonstocked	Poorly stocked	Moderately stocked	Fully stocked	Over-stocked	
White/red pine	100.0	34.5	23.1	16.3	30.1	11.3
Spruce/fir	.0	72.8	43.4	63.0	100.0	31.9
Loblolly/shortleaf	.0	100.0	36.9	38.2	.0	25.8
Oak/pine	.0	59.9	71.5	29.4	100.0	24.3
Oak/hickory	63.0	14.2	5.6	4.0	15.1	2.6
Elm/ash/red maple	64.2	22.8	16.5	17.8	34.1	10.0
Northern hardwoods	31.5	12.0	5.9	4.5	13.3	2.8
Aspen/ birch	73.1	52.6	24.6	27.1	37.4	15.3
Total	25.8	7.9	3.4	2.4	8.7	1.0

Table 5.--Number of live trees (1.0+ inches d.b.h.) on forest land by species and diameter class, Pennsylvania, 2002

(In thousands of trees)

Species	Diameter class (inches at breast height)						
	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9
White and red pine	93,959	37,429	23,739	18,944	10,238	7,377	5,982
Virginia pine	9,839	6,035	5,155	5,400	4,452	1,561	924
Other yellow pines	17,310	7,627	7,100	4,989	3,458	3,203	869
Eastern hemlock	64,835	69,380	49,275	35,391	23,349	16,967	10,385
Other softwoods	17,427	16,002	11,127	7,505	3,784	1,558	124
Total softwoods	203,370	136,473	96,395	72,230	45,281	30,665	18,284
Red maple	799,923	364,484	223,003	145,725	93,231	57,182	32,678
Sugar maple	211,134	91,033	54,333	39,497	30,313	21,537	12,080
Yellow birch	19,289	16,112	11,001	9,948	6,178	4,466	1,676
Sweet birch	541,854	137,527	53,118	39,872	26,441	14,378	6,187
Hickory	66,665	29,718	16,820	13,101	8,984	6,680	4,338
Beech	337,618	67,829	35,941	21,029	16,922	8,543	4,800
White ash	125,308	39,123	29,403	20,955	16,124	11,871	8,766
Black walnut	11,037	8,161	3,354	3,273	2,599	1,701	596
Yellow-poplar	21,103	19,837	8,870	7,829	6,753	5,336	4,473
Blackgum	152,118	78,568	24,359	9,391	4,819	1,887	662
Aspen	47,186	17,095	8,670	6,387	5,151	2,323	1,476
Black cherry	411,589	153,386	69,209	46,030	32,507	24,505	17,703
Chestnut oak	56,680	20,740	34,887	46,780	39,555	28,571	18,028
Northern red oak	102,738	36,018	23,214	20,732	20,438	20,297	16,079
Select white oaks	29,252	20,732	22,186	23,862	21,851	14,953	10,864
Other oaks	40,298	14,431	14,492	14,180	12,395	11,103	8,446
Black locust	51,029	11,278	10,369	8,299	4,937	3,467	2,451
Basswood	9,919	4,557	3,800	4,389	4,275	3,507	3,061
Other hardwoods	218,087	64,229	26,646	21,999	16,618	10,461	5,468
Other noncomm hardwoods	924,960	209,130	73,203	25,245	11,201	4,191	2,126
Total hardwoods	4,177,787	1,403,990	746,879	528,524	381,294	256,961	161,960
All species	4,381,158	1,540,463	843,275	600,753	426,575	287,626	180,244
SE	3.3	3.2	1.9	1.9	1.9	2.1	2.5

Table 5.-continued

(In thousands of trees)

Species SE	Diameter class (inches at breast height)							
	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	Total 5.0+	All classes	SE
White and red pine	2,494	1,939	742	1,904	356	73,716	205,104	12.2
Virginia pine	105	57	0	0	0	17,654	33,528	24.8
Other yellow pines	676	114	245	0	0	20,654	45,591	22.1
Eastern hemlock	8,329	4,280	1,471	1,886	299	151,632	285,847	8.6
Other softwoods	119	0	0	129	0	24,346	57,775	19.5
Total softwoods	11,724	6,389	2,458	3,919	656	288,002	627,845	6.4
Red maple	20,214	10,945	4,553	4,311	242	592,084	1,756,491	4.1
Sugar maple	7,361	3,713	1,795	1,727	251	172,608	474,775	6.5
Yellow birch	654	180	61	120	0	34,283	69,685	13.5
Sweet birch	3,225	1,091	917	297	0	145,526	824,907	7.6
Hickory	1,172	1,610	418	737	0	53,860	150,243	8.1
Beech	4,251	2,578	1,115	1,157	0	96,335	501,782	7.3
White ash	6,309	2,434	1,473	1,324	418	99,078	263,509	7.4
Black walnut	579	232	115	119	0	12,569	31,767	21.9
Yellow-poplar	4,479	2,894	1,266	3,059	184	45,144	86,083	12.5
Blackgum	231	184	175	174	0	41,882	272,568	10.4
Aspen	345	60	113	113	0	24,639	88,920	19.6
Black cherry	12,000	7,897	4,748	4,052	242	218,892	783,867	6.9
Chestnut oak	10,046	5,428	1,711	1,853	300	187,159	264,578	7.6
Northern red oak	11,916	9,871	5,919	5,325	825	134,616	273,373	7.0
Select white oaks	6,463	3,739	1,961	2,247	287	108,415	158,400	7.5
Other oaks	6,042	3,702	2,520	2,519	186	75,586	130,315	8.1
Black locust	1,496	969	526	230	0	32,744	95,052	18.5
Basswood	2,028	809	180	236	178	22,463	36,939	18.1
Other hardwoods	3,577	1,494	609	954	235	88,063	370,379	9.2
Other noncomm hardwoods	473	417	0	189	0	117,046	1,251,137	5.4
Total hardwoods	102,861	60,248	30,177	30,742	3,349	2,302,995	7,884,773	2.2
All species	114,585	66,637	32,635	34,662	4,005	2,590,997	8,512,618	2.1
SE	2.9	3.6	5.0	5.2	12.3	1.3	2.1	

Table 5 (SE).--Number of live trees (1.0+ inches d.b.h.) on forest land by species and diameter class, Pennsylvania, 2002

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)						
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9
White and red pine	19.0	19.8	12.9	13.8	13.6	16.2	17.6
Virginia pine	38.7	51.3	24.1	23.5	26.6	28.8	30.1
Other yellow pines	41.0	41.4	24.0	21.8	20.0	18.0	34.8
Eastern hemlock	15.8	15.4	9.0	8.6	9.2	9.3	11.0
Other softwoods	25.7	31.6	26.2	28.0	30.0	31.1	71.0
Total softwoods	11.4	10.9	6.9	6.7	6.9	6.9	8.7
Red maple	7.0	6.3	3.3	3.5	4.0	4.5	5.9
Sugar maple	10.4	11.2	5.9	6.4	7.5	8.9	9.6
Yellow birch	30.7	23.9	11.8	13.1	12.3	14.8	21.3
Sweet birch	10.0	10.6	7.4	8.2	7.9	8.7	13.0
Hickory	12.7	16.2	9.6	10.5	10.6	12.5	13.4
Beech	8.5	13.2	7.7	8.9	8.9	10.4	13.2
White ash	11.2	14.9	8.7	8.4	8.5	9.1	10.4
Black walnut	42.6	39.4	20.3	22.6	19.6	25.4	34.3
Yellow-poplar	24.8	25.4	16.7	17.6	14.4	14.6	15.9
Blackgum	12.9	13.9	9.6	12.4	13.8	21.9	30.2
Aspen	29.2	30.4	16.2	17.1	21.0	23.6	23.5
Black cherry	10.7	11.0	7.1	6.4	6.7	7.4	8.6
Chestnut oak	24.3	23.7	9.3	8.0	7.1	6.9	8.3
Northern red oak	13.8	17.7	7.4	7.5	8.0	7.8	8.0
Select white oaks	19.3	23.9	10.3	9.1	8.4	9.0	10.4
Other oaks	19.1	24.0	10.9	10.1	9.3	9.3	9.9
Black locust	31.2	29.1	14.2	13.9	15.7	15.8	18.9
Basswood	40.0	62.1	22.8	16.9	16.5	21.6	19.7
Other hardwoods	12.5	14.1	9.0	8.4	9.1	9.9	12.1
Other noncomm hardwoods	6.4	8.4	6.4	7.8	9.4	15.0	17.7
Total hardwoods	3.5	3.4	2.0	2.0	2.0	2.2	2.6
All species	3.3	3.2	1.9	1.9	1.9	2.1	2.5

Table 5 (SE).-continued

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)						
	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	Total 5.0+	All classes
White and red pine	19.1	19.6	31.4	21.6	40.8	10.4	12.2
Virginia pine	100.0	100.0	.0	.0	.0	21.8	24.8
Other yellow pines	33.2	70.7	50.1	.0	.0	17.3	22.1
Eastern hemlock	12.3	14.9	22.1	20.0	44.6	7.3	8.6
Other softwoods	71.0	.0	.0	70.7	.0	24.9	19.5
Total softwoods	10.1	12.0	16.9	14.5	30.1	5.5	6.4
Red maple	6.7	8.6	14.0	13.1	50.0	2.7	4.1
Sugar maple	10.8	14.3	20.0	23.0	50.0	5.4	6.5
Yellow birch	30.1	57.6	100.0	70.7	.0	9.2	13.5
Sweet birch	15.0	24.8	25.7	44.6	.0	6.1	7.6
Hickory	24.1	19.5	37.8	28.8	.0	7.5	8.1
Beech	13.7	17.7	22.9	22.8	.0	6.7	7.3
White ash	12.3	18.9	22.0	23.0	37.9	5.9	7.4
Black walnut	34.3	50.0	70.7	70.7	.0	14.2	21.9
Yellow-poplar	15.3	17.3	23.7	17.2	57.9	9.8	12.5
Blackgum	49.8	57.8	57.8	57.7	.0	8.7	10.4
Aspen	47.0	100.0	100.0	100.0	.0	14.4	19.6
Black cherry	8.7	10.7	14.4	13.7	50.0	4.6	6.9
Chestnut oak	9.5	12.2	18.7	23.6	44.7	5.6	7.6
Northern red oak	8.5	9.7	11.2	12.2	26.6	4.6	7.0
Select white oaks	11.2	15.1	17.8	18.4	44.7	6.4	7.5
Other oaks	12.1	14.0	16.9	17.3	57.8	5.9	8.1
Black locust	24.4	28.3	35.9	60.9	.0	10.9	18.5
Basswood	21.3	30.0	57.7	50.1	57.8	12.9	18.1
Other hardwoods	14.7	20.7	31.5	29.6	50.0	6.3	9.2
Other noncomm hardwoods	39.3	37.8	.0	57.9	.0	5.5	5.4
Total hardwoods	3.0	3.8	5.1	5.5	13.6	1.4	2.2
All species	2.9	3.6	5.0	5.2	12.3	1.3	2.1

Table 6.--Number of live trees (1.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 2002

(In thousands of trees)

Species	Diameter class (inches at breast height)						
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9
White and red pine	93,959	37,429	23,616	18,763	10,058	7,377	5,925
Virginia pine	9,839	6,035	5,155	5,341	4,452	1,561	924
Other yellow pines	17,310	7,627	7,100	4,989	3,458	3,203	869
Eastern hemlock	64,092	67,151	48,557	34,615	23,050	16,489	10,265
Other softwoods	15,921	14,507	10,825	7,144	3,482	1,438	124
Total softwoods	201,121	132,749	95,254	70,853	44,501	30,067	18,108
Red maple	796,052	363,742	218,485	141,543	91,120	56,137	31,413
Sugar maple	209,652	88,056	53,153	38,342	29,643	21,222	11,901
Yellow birch	18,584	16,112	10,649	9,596	5,947	4,169	1,555
Sweet birch	540,377	135,293	50,084	37,478	25,135	13,834	5,889
Hickory	64,340	26,745	16,089	12,497	8,500	6,387	4,086
Beech	327,922	59,584	33,804	19,724	16,261	8,138	4,569
White ash	124,525	39,123	28,908	20,773	15,808	11,619	8,462
Black walnut	10,308	8,161	3,120	3,097	2,541	1,515	596
Yellow-poplar	21,103	19,837	8,870	7,829	6,753	5,336	4,473
Blackgum	151,348	78,568	23,922	9,131	4,754	1,887	662
Aspen	47,186	17,095	8,611	6,269	5,086	2,323	1,476
Black cherry	402,848	152,677	68,745	45,346	32,035	24,158	17,174
Chestnut oak	56,680	20,740	34,460	45,819	37,811	27,730	17,785
Northern red oak	101,295	34,580	23,041	20,098	19,788	19,587	15,610
Select white oaks	29,252	20,732	21,823	23,499	21,024	14,525	10,675
Other oaks	39,514	14,431	14,433	14,058	12,079	10,979	8,322
Black locust	51,029	11,278	10,245	8,242	4,753	3,341	2,451
Basswood	9,919	4,557	3,800	4,207	4,093	3,446	3,000
Other hardwoods	211,515	60,636	25,710	21,590	16,365	10,230	5,293
Other noncomm hardwoods	897,176	208,323	71,535	24,868	11,080	4,128	2,126
Total hardwoods	4,110,624	1,380,270	729,487	514,009	370,575	250,693	157,520
All species	4,311,745	1,513,019	824,741	584,862	415,076	280,761	175,627
SE	3.4	3.3	2.0	2.0	2.0	2.1	2.6

Table 6.-continued

(In thousands of trees)

Species	Diameter class (inches at breast height)							
SE	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	Total 5.0+	All classes	SE
White and red pine	2,435	1,939	742	1,904	356	73,114	204,503	12.2
Virginia pine	105	57	0	0	0	17,595	33,469	24.9
Other yellow pines	676	114	245	0	0	20,654	45,591	22.1
Eastern hemlock	8,269	4,219	1,471	1,886	299	149,122	280,366	8.7
Other softwoods	119	0	0	129	0	23,263	53,690	20.2
Total softwoods	11,605	6,329	2,458	3,919	656	283,749	617,619	6.5
Red maple	19,850	10,416	4,488	4,185	242	577,879	1,737,673	4.1
Sugar maple	7,179	3,528	1,795	1,727	251	168,739	466,447	6.6
Yellow birch	654	180	61	120	0	32,931	67,627	13.8
Sweet birch	3,044	1,091	857	297	0	137,709	813,380	7.7
Hickory	1,172	1,610	418	737	0	51,495	142,580	8.2
Beech	4,064	2,517	1,115	1,157	0	91,348	478,855	7.4
White ash	6,188	2,434	1,473	1,202	418	97,287	260,934	7.5
Black walnut	579	232	115	119	0	11,916	30,384	22.5
Yellow-poplar	4,479	2,894	1,266	3,002	184	45,087	86,026	12.5
Blackgum	231	184	175	117	0	41,064	270,979	10.4
Aspen	345	60	113	113	0	24,397	88,678	19.6
Black cherry	11,823	7,543	4,558	3,745	242	215,371	770,895	7.0
Chestnut oak	9,801	5,310	1,711	1,853	240	182,521	259,940	7.7
Northern red oak	11,312	9,629	5,561	5,149	768	130,544	266,419	7.2
Select white oaks	6,216	3,493	1,899	2,185	287	105,627	155,611	7.6
Other oaks	5,797	3,702	2,460	2,519	186	74,536	128,482	8.2
Black locust	1,496	969	526	230	0	32,253	94,561	18.6
Basswood	1,967	809	180	236	178	21,915	36,391	18.3
Other hardwoods	3,229	1,437	609	895	235	85,594	357,745	9.2
Other noncomm hardwoods	473	417	0	189	0	114,818	1,220,317	5.5
Total hardwoods	99,899	58,456	29,383	29,777	3,233	2,243,032	7,733,926	2.3
All species	111,503	64,785	31,841	33,696	3,888	2,526,781	8,351,545	2.1
SE	3.0	3.7	5.0	5.3	12.5	1.4	2.1	

Table 6 (SE).--Number of live trees (1.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 2002

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)						
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9
White and red pine	19.0	19.8	13.0	13.9	13.8	16.2	17.8
Virginia pine	38.7	51.3	24.1	23.8	26.6	28.8	30.1
Other yellow pines	41.0	41.4	24.0	21.8	20.0	18.0	34.8
Eastern hemlock	16.0	15.6	9.1	8.7	9.2	9.4	11.1
Other softwoods	27.3	33.3	26.8	29.3	31.8	32.6	71.0
Total softwoods	11.5	11.0	6.9	6.8	7.0	7.0	8.8
Red maple	7.0	6.4	3.4	3.5	4.1	4.6	6.0
Sugar maple	10.5	11.4	6.0	6.5	7.5	9.0	9.7
Yellow birch	31.6	23.9	12.1	13.3	12.6	15.0	22.2
Sweet birch	10.0	10.8	7.4	8.2	8.1	8.9	13.4
Hickory	12.9	17.2	9.8	10.8	10.9	12.9	13.7
Beech	8.7	13.2	7.8	8.9	9.0	10.5	13.3
White ash	11.2	14.9	8.9	8.5	8.6	9.1	10.4
Black walnut	45.0	39.4	20.5	23.2	19.9	25.8	34.3
Yellow-poplar	24.8	25.4	16.7	17.6	14.4	14.6	15.9
Blackgum	13.0	13.9	9.7	12.6	13.9	21.9	30.2
Aspen	29.2	30.4	16.3	17.3	21.2	23.6	23.5
Black cherry	10.8	11.1	7.1	6.5	6.8	7.5	8.8
Chestnut oak	24.3	23.7	9.3	8.1	7.1	7.0	8.4
Northern red oak	14.0	18.2	7.5	7.6	8.2	8.0	8.1
Select white oaks	19.3	23.9	10.4	9.2	8.4	9.1	10.5
Other oaks	19.4	24.0	11.0	10.2	9.4	9.4	9.9
Black locust	31.2	29.1	14.3	14.0	16.2	16.3	18.9
Basswood	40.0	62.1	22.8	17.4	16.9	22.0	20.0
Other hardwoods	12.6	14.1	8.9	8.4	9.2	10.0	12.3
Other noncomm hardwoods	6.5	8.4	6.5	7.9	9.4	15.2	17.7
Total hardwoods	3.5	3.4	2.1	2.0	2.0	2.2	2.7
All species	3.4	3.3	2.0	2.0	2.0	2.1	2.6

Table 6 (SE).-continued

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)						
	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	Total 5.0+	All classes
White and red pine	19.4	19.6	31.4	21.6	40.8	10.5	12.2
Virginia pine	100.0	100.0	.0	.0	.0	21.9	24.9
Other yellow pines	33.2	70.7	50.1	.0	.0	17.3	22.1
Eastern hemlock	12.4	15.1	22.1	20.0	44.6	7.4	8.7
Other softwoods	71.0	.0	.0	70.7	.0	25.8	20.2
Total softwoods	10.1	12.1	16.9	14.5	30.1	5.5	6.5
Red maple	6.8	8.9	14.1	13.3	50.0	2.7	4.1
Sugar maple	10.9	14.8	20.0	23.0	50.0	5.4	6.6
Yellow birch	30.1	57.6	100.0	70.7	.0	9.2	13.8
Sweet birch	15.3	24.8	26.6	44.6	.0	6.1	7.7
Hickory	24.1	19.5	37.8	28.8	.0	7.7	8.2
Beech	14.2	17.9	22.9	22.8	.0	6.6	7.4
White ash	12.4	18.9	22.0	24.3	37.9	6.0	7.5
Black walnut	34.3	50.0	70.7	70.7	.0	14.5	22.5
Yellow-poplar	15.3	17.3	23.7	17.4	57.9	9.8	12.5
Blackgum	49.8	57.8	57.8	70.7	.0	8.8	10.4
Aspen	47.0	100.0	100.0	100.0	.0	14.5	19.6
Black cherry	8.8	11.0	14.7	14.0	50.0	4.6	7.0
Chestnut oak	9.5	12.4	18.7	23.6	50.0	5.7	7.7
Northern red oak	8.7	9.8	11.5	12.4	27.7	4.6	7.2
Select white oaks	11.4	15.6	18.1	18.7	44.7	6.4	7.6
Other oaks	12.5	14.0	17.2	17.3	57.8	6.0	8.2
Black locust	24.4	28.3	35.9	60.9	.0	11.0	18.6
Basswood	21.8	30.0	57.7	50.1	57.8	13.1	18.3
Other hardwoods	14.4	21.2	31.5	30.9	50.0	6.3	9.2
Other noncomm hardwoods	39.3	37.8	.0	57.9	.0	5.6	5.5
Total hardwoods	3.1	3.9	5.2	5.6	13.9	1.4	2.3
All species	3.0	3.7	5.0	5.3	12.5	1.4	2.1

Table 7.--Number of trees (5.0+ inches d.b.h.) on timberland by species and tree class, Pennsylvania, 2002

(In thousands of trees)

Species	Tree class								All classes	SE
	Preferred	Acceptable	All growing stock	Rough cull	Rotten cull	All live	Salvable dead	Nonsalvable dead		
White and red pine	734	68,805	69,539	3,274	301	73,114	1,443	7,698	82,256	10.2
Virginia pine	0	16,746	16,746	613	237	17,595	675	2,074	20,345	21.5
Other yellow pines	0	18,803	18,803	1,468	384	20,654	594	4,172	25,420	15.5
Eastern hemlock	1,574	133,682	135,256	12,590	1,277	149,122	2,163	7,271	158,557	7.4
Other softwoods	318	21,928	22,246	1,017	0	23,263	249	1,409	24,921	25.4
Total softwoods	2,626	259,963	262,589	18,961	2,198	283,749	5,125	22,625	311,499	5.5
Red maple	965	540,220	541,185	16,047	20,647	577,879	2,877	26,351	607,106	2.7
Sugar maple	357	160,491	160,848	3,182	4,709	168,739	414	15,555	184,709	5.3
Yellow birch	57	30,029	30,086	1,177	1,668	32,931	1,027	4,640	38,598	8.8
Sweet birch	60	132,155	132,215	2,448	3,046	137,709	2,282	8,585	148,577	6.0
Hickory	426	49,526	49,952	533	1,010	51,495	233	856	52,585	7.7
Beech	174	81,034	81,208	2,751	7,389	91,348	413	11,497	103,259	6.6
White ash	1,446	90,448	91,894	2,885	2,508	97,287	2,542	3,994	103,823	6.0
Black walnut	0	10,674	10,674	803	439	11,916	67	552	12,535	14.3
Yellow-poplar	3,289	40,928	44,217	368	502	45,087	481	1,535	47,104	9.8
Blackgum	113	37,989	38,102	1,431	1,531	41,064	62	492	41,618	8.8
Aspen	57	23,897	23,953	186	257	24,397	465	2,905	27,768	14.3
Black cherry	3,271	194,025	197,295	10,552	7,523	215,371	2,005	18,170	235,545	4.6
Chestnut oak	243	174,024	174,267	3,680	4,574	182,521	1,394	23,347	207,262	5.5
Northern red oak	5,442	122,607	128,049	974	1,521	130,544	1,031	15,365	146,940	4.7
Select white oaks	892	101,750	102,641	1,849	1,136	105,627	1,247	11,673	118,547	6.2
Other oaks	1,287	70,894	72,181	1,189	1,165	74,536	981	6,066	81,583	5.9
Black locust	0	24,365	24,365	1,317	6,571	32,253	667	11,911	44,831	9.7
Basswood	236	20,407	20,643	547	726	21,915	119	941	22,975	12.9
Other hardwoods	348	77,828	78,177	4,717	2,701	85,594	2,605	17,075	105,274	6.1
Other noncomm hardwoods	0	0	0	102,125	12,693	114,818	2,526	25,083	142,427	5.2
Total hardwoods	18,662	1,983,290	2,001,951	158,762	82,318	2,243,032	23,438	206,597	2,473,067	1.4
All species	21,287	2,243,253	2,264,541	177,724	84,517	2,526,781	28,563	229,221	2,784,566	1.4
SE	7.4	1.5	1.5	3.9	4.5	1.4	6.1	2.9	1.4	

Table 7 (SE).--Number of trees (5.0+ inches d.b.h.) on timberland by species and tree class, Pennsylvania, 2002
(Standard error as percentage of total)

Species	Tree class								All classes
	Preferred	Acceptable	All growing stock	Rough cull	Rotten cull	All live	Salvable dead	Nonsalvable dead	
White and red pine	35.7	10.8	10.8	18.8	52.1	10.5	29.0	14.2	10.2
Virginia pine	.0	22.0	22.0	37.3	50.0	21.9	36.9	27.3	21.5
Other yellow pines	.0	17.6	17.6	34.7	47.7	17.3	36.9	19.6	15.5
Eastern hemlock	30.0	7.7	7.7	12.1	23.7	7.4	20.5	14.6	7.4
Other softwoods	72.4	26.6	26.5	31.7	.0	25.8	81.1	42.2	25.4
Total softwoods	22.8	5.7	5.7	9.3	18.3	5.5	14.1	8.4	5.5
Red maple	29.2	2.8	2.8	7.9	6.9	2.7	15.6	7.1	2.7
Sugar maple	52.8	5.5	5.5	15.8	14.7	5.4	43.0	11.2	5.3
Yellow birch	100.0	9.4	9.4	23.4	20.8	9.2	25.5	15.6	8.8
Sweet birch	100.0	6.2	6.2	19.4	18.0	6.1	21.3	11.3	6.0
Hickory	37.8	7.8	7.7	33.3	25.4	7.7	49.9	26.7	7.7
Beech	74.0	6.7	6.7	19.0	13.3	6.6	37.7	13.6	6.6
White ash	26.4	6.2	6.2	15.5	18.4	6.0	24.1	17.1	6.0
Black walnut	.0	15.1	15.1	29.7	37.8	14.5	100.0	40.2	14.3
Yellow-poplar	19.8	10.2	9.9	40.8	35.1	9.8	35.2	26.5	9.8
Blackgum	100.0	8.6	8.7	41.3	22.1	8.8	100.0	35.3	8.8
Aspen	100.0	14.8	14.7	73.1	50.1	14.5	39.2	20.8	14.3
Black cherry	18.9	4.9	4.8	10.9	12.9	4.6	19.8	9.0	4.6
Chestnut oak	50.1	5.8	5.8	15.0	18.3	5.7	23.2	8.8	5.5
Northern red oak	12.8	4.7	4.7	25.0	19.8	4.6	26.8	10.6	4.7
Select white oaks	28.9	6.5	6.4	19.5	33.0	6.4	23.7	10.2	6.2
Other oaks	25.1	6.1	6.1	23.2	27.7	6.0	27.8	13.9	5.9
Black locust	.0	11.7	11.7	23.0	24.0	11.0	37.4	12.5	9.7
Basswood	61.5	13.5	13.5	46.4	35.8	13.1	70.6	30.2	12.9
Other hardwoods	40.8	6.5	6.5	14.2	18.7	6.3	18.7	11.1	6.1
Other noncomm hardwoods	.0	.0	.0	5.9	10.1	5.6	19.6	7.6	5.2
Total hardwoods	7.8	1.5	1.5	4.2	4.6	1.4	6.6	3.1	1.4
All species	7.4	1.5	1.5	3.9	4.5	1.4	6.1	2.9	1.4

Table 8.--Number of growing-stock trees (5.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 2002

(In thousands of trees)

Species	Diameter class (inches at breast height)									All classes	SE
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+		
White and red pine	23,189	18,291	8,975	6,891	5,316	2,295	1,820	680	1,725	356	69,539	10.8
Virginia pine	4,797	5,341	4,078	1,505	862	105	57	0	0	0	16,746	22.0
Other yellow pines	6,541	4,806	2,899	2,837	742	676	57	245	0	0	18,803	17.6
Eastern hemlock	47,293	33,926	17,909	13,870	8,571	7,083	3,621	1,159	1,586	239	135,256	7.7
Other softwoods	10,349	7,144	3,002	1,378	124	119	0	0	129	0	22,246	26.5
Total softwoods	92,169	69,508	36,864	26,481	15,615	10,278	5,554	2,084	3,440	596	262,589	5.7
Red maple	203,345	134,792	87,704	49,683	29,266	18,760	9,506	4,297	3,589	242	541,185	2.8
Sugar maple	50,330	37,239	29,004	19,651	11,039	6,822	3,289	1,678	1,545	251	160,848	5.5
Yellow birch	10,045	9,297	5,702	2,999	1,262	541	180	0	60	0	30,086	9.4
Sweet birch	48,846	36,555	24,651	12,669	5,110	2,499	972	676	237	0	132,215	6.2
Hickory	15,556	12,079	8,381	6,148	3,970	1,112	1,550	418	737	0	49,952	7.7
Beech	30,321	18,282	14,955	6,814	3,517	3,233	2,226	886	975	0	81,208	6.7
White ash	27,474	19,819	15,219	10,692	7,983	5,845	2,368	1,294	1,075	124	91,894	6.2
Black walnut	2,930	3,030	2,411	967	403	522	175	115	119	0	10,674	15.1
Yellow-poplar	8,618	7,767	6,639	5,207	4,362	4,412	2,827	1,266	3,002	117	44,217	9.9
Blackgum	22,053	8,504	4,584	1,768	602	231	127	175	57	0	38,102	8.7
Aspen	8,360	6,201	5,029	2,255	1,476	345	60	113	113	0	23,953	14.7
Black cherry	62,499	42,544	30,081	20,688	15,437	10,735	7,123	4,498	3,448	242	197,295	4.8
Chestnut oak	32,819	44,832	36,874	25,929	16,523	8,599	5,129	1,591	1,731	240	174,267	5.8
Northern red oak	22,050	19,630	19,665	19,289	15,431	11,121	9,629	5,440	5,024	768	128,049	4.7
Select white oaks	21,027	23,029	20,967	13,986	10,381	6,155	3,433	1,547	1,829	287	102,641	6.4
Other oaks	13,800	13,940	11,894	10,420	7,949	5,619	3,578	2,276	2,519	186	72,181	6.1
Black locust	8,031	6,699	3,860	1,926	1,592	1,068	664	409	116	0	24,365	11.7
Basswood	3,306	4,017	3,976	3,320	2,945	1,903	698	180	176	121	20,643	13.5
Other hardwoods	22,527	20,053	15,754	9,291	4,814	2,941	1,437	545	704	111	78,177	6.5
Total hardwoods	613,939	468,309	347,352	223,700	144,063	92,464	54,971	27,406	27,057	2,690	2,001,951	1.5
All species	706,108	537,818	384,216	250,181	159,678	102,742	60,525	29,490	30,497	3,286	2,264,541	1.5
SE	2.1	2.1	2.0	2.3	2.7	3.1	3.8	5.3	5.6	13.5	1.5	

Table 8 (SE).--Number of growing-stock trees (5.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 2002

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)										All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	
White and red pine	13.0	14.1	14.7	17.1	19.1	20.1	20.4	33.0	22.0	40.8	10.8
Virginia pine	23.6	23.8	27.9	29.6	31.5	100.0	100.0	.0	.0	.0	22.0
Other yellow pines	25.3	22.0	21.5	17.8	33.1	33.2	100.0	50.1	.0	.0	17.6
Eastern hemlock	9.2	8.8	10.4	9.9	11.7	13.2	16.5	25.4	22.3	49.9	7.7
Other softwoods	27.1	29.3	35.9	32.7	71.0	71.0	.0	.0	70.7	.0	26.5
Total softwoods	7.0	6.9	7.8	7.4	9.4	10.7	13.0	18.6	15.4	31.6	5.7
Red maple	3.5	3.7	4.2	4.9	6.2	6.9	8.9	14.5	14.3	50.0	2.8
Sugar maple	6.0	6.5	7.6	9.2	10.0	11.3	15.1	20.8	23.5	50.0	5.5
Yellow birch	12.4	13.3	13.0	17.4	25.5	33.3	57.6	.0	100.0	.0	9.4
Sweet birch	7.5	8.3	8.1	9.1	14.3	16.5	26.5	30.0	49.9	.0	6.2
Hickory	9.7	10.9	11.1	13.2	14.0	23.6	19.9	37.8	28.8	.0	7.7
Beech	8.0	9.2	9.3	11.3	14.6	15.2	19.4	25.7	24.9	.0	6.7
White ash	9.2	8.7	8.7	9.4	10.6	13.0	19.2	23.8	25.9	71.0	6.2
Black walnut	20.9	23.4	20.6	33.4	42.7	36.4	57.7	70.7	70.7	.0	15.1
Yellow-poplar	17.0	17.7	14.5	14.8	16.1	15.5	17.5	23.7	17.4	70.7	9.9
Blackgum	9.8	12.0	14.0	21.3	31.7	49.8	70.7	57.8	100.0	.0	8.7
Aspen	16.5	17.5	21.4	24.2	23.5	47.0	100.0	100.0	100.0	.0	14.7
Black cherry	7.5	6.7	6.9	8.0	9.3	9.4	11.5	14.8	14.5	50.0	4.8
Chestnut oak	9.6	8.2	7.1	7.2	8.7	10.3	12.6	19.4	24.3	50.0	5.8
Northern red oak	7.6	7.7	8.2	8.0	8.1	8.7	9.8	11.7	12.6	27.7	4.7
Select white oaks	10.5	9.4	8.4	9.3	10.7	11.5	15.8	20.2	19.9	44.7	6.4
Other oaks	11.3	10.3	9.5	9.6	10.2	12.7	14.3	18.0	17.3	57.8	6.1
Black locust	15.8	15.9	17.3	20.0	23.4	27.0	32.2	42.0	70.7	.0	11.7
Basswood	24.0	17.9	17.3	21.9	20.3	22.3	31.0	57.7	57.8	70.7	13.5
Other hardwoods	9.7	8.6	9.4	10.7	12.9	15.0	21.2	33.3	33.4	70.2	6.5
Total hardwoods	2.2	2.1	2.1	2.4	2.9	3.2	4.0	5.5	6.0	15.0	1.5
All species	2.1	2.1	2.0	2.3	2.7	3.1	3.8	5.3	5.6	13.5	1.5

Table 9.--Net volume of all trees (5.0+ inches d.b.h.) on timberland by class of timber and species group, Pennsylvania, 2002

(In millions of cubic feet)

Class of timber	Species group				All species	SE
	Pines	Other softwoods	Soft hardwoods	Hard hardwoods		
Growing-stock trees:						
Sawtimber size:						
Sawlog portion	802.5	1,096.7	7,187.0	7,419.5	16,505.7	2.2
Upper stem	96.4	131.2	1,650.1	1,703.5	3,581.2	2.1
Total sawtimber size	898.9	1,227.9	8,837.2	9,123.0	20,087.0	2.2
Poletimber size	264.5	370.6	4,492.5	4,081.3	9,209.0	1.8
Total growing-stock trees	1,163.4	1,598.5	13,329.7	13,204.3	29,295.9	1.7
Rough trees:						
Sawtimber size	42.2	190.3	355.6	221.5	809.6	6.1
Poletimber size	3.2	3.2	238.4	136.3	381.1	5.3
Total rough trees	45.4	193.5	594.0	357.8	1,190.7	4.6
Rotten trees:						
Sawtimber size	2.1	5.5	94.9	115.1	217.6	7.5
Poletimber size	.2	.2	22.1	19.6	42.1	9.7
Total rotten trees	2.2	5.7	117.0	134.7	259.7	6.6
Salvable dead[a] trees:						
Sawtimber size	4.9	10.9	21.8	32.8	70.4	17.2
Poletimber size	5.2	4.0	36.1	25.3	70.6	9.9
Total salvable dead trees	10.1	14.9	57.9	58.1	141.0	10.2
All classes	1,221.1	1,812.6	14,098.6	13,755.0	30,887.2	1.7
SE	9.3	7.6	2.5	2.3	1.7	

[a] Includes noncommercial species.

Table 9 (SE).--Net volume of all trees (5.0+ inches d.b.h.) on timberland by class of timber and species group, Pennsylvania, 2002

(Standard error as percentage of total)

Class of timber	Species group				All species
	Pines	Other softwoods	Soft hardwoods	Hard hardwoods	
Growing-stock trees:					
Sawtimber size:					
Sawlog portion	10.7	8.7	3.4	3.0	2.2
Upper stem	10.6	8.3	3.2	2.8	2.1
Total sawtimber size	10.7	8.7	3.4	2.9	2.2
Poletimber size	12.0	8.9	2.6	2.7	1.8
Total growing-stock trees	9.5	7.9	2.6	2.4	1.7
Rough trees:					
Sawtimber size	18.3	14.6	9.6	8.8	6.1
Poletimber size	33.8	37.1	7.5	7.0	5.3
Total rough trees	17.4	14.4	6.9	6.2	4.6
Rotten trees:					
Sawtimber size	61.2	40.2	12.3	9.8	7.5
Poletimber size	70.4	72.9	11.9	14.6	9.7
Total rotten trees	56.9	38.9	10.4	8.8	6.6
Salvable dead[a] trees:					
Sawtimber size	42.8	52.9	25.3	26.9	17.2
Poletimber size	29.7	34.3	14.3	15.1	9.9
Total salvable dead trees	25.7	40.0	13.8	17.0	10.2
All classes	9.3	7.6	2.5	2.3	1.7

[a] Includes noncommercial species.

Table 10.--Sound volume of all live trees (5.0+ inches d.b.h.) on forest land by species and diameter class, Pennsylvania, 2002

(In millions of cubic feet)

Species	Diameter class (inches at breast height)										All classes	SE
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+		
White and red pine	67.3	117.2	110.8	128.3	144.2	84.3	84.6	41.6	138.6	59.8	976.6	11.3
Virginia pine	13.9	34.8	45.0	24.7	18.6	3.2	2.3	.0	.0	.0	142.6	24.0
Other yellow pines	15.2	29.1	29.6	45.7	16.2	22.1	2.0	11.7	.0	.0	171.6	16.1
Eastern hemlock	123.2	197.2	191.9	236.1	216.9	240.2	160.7	65.2	124.0	33.8	1,589.1	8.2
Other softwoods	26.5	44.4	34.4	26.1	3.1	4.1	.0	.0	10.5	.0	149.1	25.0
Total softwoods	246.2	422.6	411.6	460.8	398.9	354.0	249.6	118.5	273.1	93.5	3,029.0	6.1
Red maple	534.9	940.3	1,155.1	1,094.1	942.8	789.6	538.5	289.7	327.6	53.7	6,666.4	3.4
Sugar maple	155.8	286.7	421.8	450.6	358.9	298.2	185.9	115.8	153.2	48.8	2,475.6	6.6
Yellow birch	30.1	66.5	73.4	63.6	36.5	19.7	9.0	.0	3.6	.0	302.5	10.2
Sweet birch	142.6	278.5	324.0	262.1	150.6	99.4	48.4	37.4	22.3	.0	1,365.4	6.4
Hickory	38.8	84.8	124.4	142.7	137.1	47.7	89.0	28.6	65.9	.0	759.0	8.5
Beech	83.8	139.5	213.5	160.1	117.5	144.9	132.8	62.0	95.9	.0	1,149.9	7.8
White ash	80.6	139.5	209.4	239.0	269.8	261.4	142.9	99.0	126.5	29.1	1,597.1	7.3
Black walnut	7.1	18.6	27.6	20.8	11.3	19.1	8.3	8.2	8.6	.0	129.6	16.5
Yellow-poplar	24.1	56.1	93.9	123.1	156.6	215.5	177.9	108.6	362.4	27.8	1,345.8	10.0
Blackgum	46.0	46.9	45.6	32.7	16.4	8.5	5.7	10.9	10.1	.0	222.9	9.8
Aspen	25.6	45.9	66.1	46.2	45.4	13.0	2.6	7.6	10.3	.0	262.6	17.0
Black cherry	184.9	314.3	419.8	488.3	535.3	508.6	449.6	365.3	396.5	45.6	3,708.0	5.6
Chestnut oak	81.8	264.4	401.7	456.9	408.5	289.8	221.4	84.6	131.4	45.7	2,386.3	5.5
Northern red oak	59.0	133.5	242.8	381.7	445.5	449.3	496.9	366.9	495.8	146.5	3,218.2	5.2
Select white oaks	56.7	150.3	254.3	274.0	304.1	245.8	181.3	99.8	165.3	71.0	1,802.7	6.5
Other oaks	35.7	89.2	146.9	205.2	221.5	224.5	177.8	148.2	215.7	32.6	1,497.3	6.8
Black locust	20.0	39.6	42.1	31.8	38.6	36.0	26.6	20.9	8.5	.0	264.2	13.7
Basswood	9.1	32.9	63.1	84.4	103.3	93.0	42.6	13.0	11.8	15.5	468.6	14.3
Other hardwoods	65.2	134.9	199.2	188.8	146.5	134.0	76.4	33.5	68.8	20.0	1,067.3	7.4
Total hardwoods	1,681.9	3,262.5	4,524.6	4,746.1	4,446.3	3,897.9	3,013.6	1,900.1	2,680.1	536.3	30,689.5	1.7
All species	1,928.1	3,685.2	4,936.3	5,206.9	4,845.2	4,251.9	3,263.2	2,018.6	2,953.2	629.8	33,718.4	1.7
SE	2.2	2.1	2.1	2.3	2.8	3.2	3.9	5.4	5.7	13.9	1.7	

Table 10 (SE).--Sound volume of all live trees (5.0+ inches d.b.h.) on forest land by species and diameter class, Pennsylvania, 2002

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)										All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	
White and red pine	15.2	16.3	15.3	18.5	19.6	20.2	20.5	32.7	22.2	42.7	11.3
Virginia pine	25.7	25.3	28.0	29.9	31.3	100.0	100.0	.0	.0	.0	24.0
Other yellow pines	24.0	23.1	21.2	18.0	33.3	33.1	100.0	50.7	.0	.0	16.1
Eastern hemlock	9.7	9.2	11.0	10.1	11.9	13.5	16.5	25.4	22.5	50.0	8.2
Other softwoods	26.1	29.4	32.9	30.7	70.7	71.8	.0	.0	72.5	.0	25.0
Total softwoods	7.5	7.5	8.0	7.8	9.8	10.9	13.0	18.7	15.6	32.7	6.1
Red maple	3.6	3.8	4.3	5.0	6.2	7.0	8.6	14.5	14.8	54.4	3.4
Sugar maple	6.6	6.7	8.1	9.6	10.3	11.6	14.8	21.5	23.9	51.0	6.6
Yellow birch	12.4	14.0	13.0	17.7	24.3	33.6	58.1	.0	100.0	.0	10.2
Sweet birch	8.5	8.7	8.3	9.2	14.1	16.6	26.9	29.7	50.1	.0	6.4
Hickory	10.2	12.0	11.2	13.4	14.1	24.0	20.1	38.3	29.7	.0	8.5
Beech	9.9	10.3	9.5	11.6	14.5	15.0	19.6	26.5	26.3	.0	7.8
White ash	9.7	8.6	9.0	9.9	11.3	13.3	19.8	24.1	25.6	77.3	7.3
Black walnut	21.5	22.7	20.6	32.0	43.7	37.1	57.8	70.9	70.8	.0	16.5
Yellow-poplar	18.9	18.6	15.1	15.2	16.7	15.6	17.7	24.3	17.3	71.5	10.0
Blackgum	9.9	12.2	14.0	22.1	32.1	50.1	70.7	58.6	71.3	.0	9.8
Aspen	17.4	18.3	21.7	24.8	23.4	45.8	100.0	100.0	100.0	.0	17.0
Black cherry	8.3	7.0	7.1	8.3	9.4	9.6	11.5	15.2	14.8	50.4	5.6
Chestnut oak	9.5	8.1	7.0	7.0	8.7	10.4	12.7	19.7	25.2	45.1	5.5
Northern red oak	8.1	7.9	8.2	7.9	8.3	8.8	10.1	11.4	13.0	27.3	5.2
Select white oaks	10.7	9.3	8.4	9.5	10.8	11.4	15.5	19.9	19.9	46.4	6.5
Other oaks	11.5	10.5	9.8	9.8	10.4	12.7	14.4	17.7	18.0	57.8	6.8
Black locust	16.8	16.8	17.2	20.2	24.1	27.8	33.9	45.1	71.9	.0	13.7
Basswood	24.1	17.8	17.7	21.9	20.2	22.2	32.1	57.9	59.9	74.4	14.3
Other hardwoods	11.9	9.2	10.0	11.2	13.1	15.8	21.3	33.6	34.6	70.4	7.4
Total hardwoods	2.3	2.2	2.2	2.4	2.9	3.3	4.0	5.6	6.1	15.3	1.7
All species	2.2	2.1	2.1	2.3	2.8	3.2	3.9	5.4	5.7	13.9	1.7

Table 11.--Net volume of growing-stock trees on timberland by species and forest-type group, Pennsylvania, 2002

(In millions of cubic feet)

Species	Forest-type group									Total	SE
	White/ red pine	Spruce/ fir	Loblolly/ shortleaf	Oak/ pine	Oak/ hickory	Oak/gum/ cypress	Elm/ash/ red maple	Northern hardwoods	Aspen/ birch		
White and red pine	381.2	1.0	4.4	87.9	201.2	.0	10.2	181.6	11.0	878.6	11.6
Virginia pine	.0	5.3	70.6	16.2	19.1	.0	2.1	18.7	.2	132.2	24.1
Other yellow pines	40.0	.2	24.6	23.6	41.4	.0	3.0	18.7	1.1	152.6	16.0
Eastern hemlock	536.3	.0	.0	6.5	130.0	.0	4.1	782.7	3.6	1,463.1	8.4
Other softwoods	6.3	77.6	1.8	.0	18.7	.0	.5	28.9	1.6	135.4	26.0
Total softwoods	963.8	84.1	101.4	134.2	410.5	.0	20.0	1,030.5	17.4	2,761.9	6.2
Red maple	93.5	1.5	5.1	28.1	2,254.8	.0	578.5	2,779.5	19.5	5,760.7	3.5
Sugar maple	15.4	.0	1.5	2.2	195.9	.0	17.8	1,914.0	.2	2,146.9	6.7
Yellow birch	28.3	.0	.0	.0	16.6	.0	1.6	210.9	.3	257.7	10.1
Sweet birch	32.2	.0	.0	.9	337.7	.0	9.2	803.8	4.6	1,188.5	6.4
Hickory	5.4	.0	.0	4.3	520.2	.0	10.5	116.9	3.7	661.0	8.7
Beech	19.1	.0	.0	.8	175.2	.0	1.8	769.2	1.5	967.5	7.8
White ash	19.3	1.5	3.6	8.5	346.1	.0	66.5	940.1	6.6	1,392.2	7.4
Black walnut	1.1	.0	1.4	.0	85.0	.0	8.4	12.4	.0	108.3	16.8
Yellow-poplar	33.8	.0	.0	.0	856.9	.0	15.1	313.5	3.1	1,222.4	10.0
Blackgum	.8	.0	.4	.0	161.5	.0	2.4	34.7	.0	200.0	9.8
Aspen	12.9	4.3	.0	.3	22.7	.0	25.7	106.4	70.7	243.0	17.4
Black cherry	60.1	5.3	3.4	10.1	481.1	.0	74.5	2,532.8	17.1	3,184.3	5.6
Chestnut oak	10.3	.0	.0	18.5	1,915.6	.0	1.4	100.5	2.4	2,048.8	5.6
Northern red oak	25.2	.0	1.1	23.5	2,321.3	.0	10.6	355.5	4.6	2,741.7	5.3
Select white oaks	28.6	.0	.0	18.7	1,340.8	.0	8.9	126.4	1.7	1,525.2	6.4
Other oaks	5.4	.0	1.5	15.7	1,196.9	.0	5.2	74.1	7.9	1,306.7	6.9
Black locust	3.6	.0	.0	1.2	164.7	.0	16.6	44.1	2.8	233.0	13.7
Basswood	1.6	.0	.0	.0	47.0	.0	.2	359.9	4.2	412.9	14.6
Other hardwoods	14.6	1.7	1.1	7.6	331.6	.0	167.8	321.2	87.5	933.3	7.2
Total hardwoods	411.4	14.3	19.1	140.4	12,771.8	.0	1,022.8	11,915.9	238.4	26,534.0	1.8
All species	1,375.2	98.4	120.5	274.6	13,182.2	.0	1,042.8	12,946.4	255.8	29,295.9	1.7
SE	13.4	40.6	30.6	26.4	3.3	.0	14.1	3.7	21.6	1.7	

Table 11 (SE).--Net volume of growing-stock trees on timberland by species and forest-type group, Pennsylvania, 2002

(Standard error as percentage of total)

Species	Forest-type group									Total
	White/ red pine	Spruce/ fir	Loblolly/ shortleaf	Oak/ pine	Oak/ hickory	Oak/gum/ cypress	Elm/ash/ red maple	Northern hardwoods	Aspen/ birch	
White and red pine	22.2	70.9	57.4	34.1	13.9	.0	74.8	20.4	45.9	11.6
Virginia pine	.0	100.0	40.2	58.7	32.0	.0	74.1	45.4	100.0	24.1
Other yellow pines	36.2	73.2	45.7	52.8	20.6	.0	80.7	32.6	72.1	16.0
Eastern hemlock	17.7	.0	.0	89.4	18.9	.0	71.0	9.8	87.9	8.4
Other softwoods	60.5	41.5	62.4	.0	44.8	.0	80.5	37.5	62.0	26.0
Total softwoods	13.9	41.2	31.9	27.6	10.0	.0	43.6	8.5	36.0	6.2
Red maple	22.5	77.0	56.2	43.3	5.5	.0	18.0	5.6	36.9	3.5
Sugar maple	50.2	.0	90.5	78.4	14.9	.0	48.0	7.4	72.8	6.7
Yellow birch	35.4	.0	.0	.0	32.7	.0	81.0	11.2	100.0	10.1
Sweet birch	37.4	.0	.0	100.0	8.9	.0	38.8	8.9	46.5	6.4
Hickory	50.5	.0	.0	57.3	10.5	.0	51.8	15.2	76.0	8.7
Beech	49.4	.0	.0	73.0	18.0	.0	48.3	9.0	100.0	7.8
White ash	55.0	100.0	80.2	54.4	12.9	.0	45.7	9.5	54.9	7.4
Black walnut	100.0	.0	100.0	.0	20.0	.0	56.3	34.5	.0	16.8
Yellow-poplar	52.0	.0	.0	.0	12.8	.0	56.6	17.8	70.7	10.0
Blackgum	100.0	.0	77.6	.0	11.0	.0	55.2	25.2	.0	9.8
Aspen	40.0	97.3	.0	100.0	52.9	.0	70.7	19.2	41.3	17.4
Black cherry	39.9	64.9	44.4	62.7	9.5	.0	29.2	6.9	42.6	5.6
Chestnut oak	45.1	.0	.0	65.2	6.0	.0	100.0	19.6	84.0	5.6
Northern red oak	40.0	.0	71.3	40.3	6.1	.0	49.4	11.6	69.3	5.3
Select white oaks	38.6	.0	.0	61.9	7.1	.0	83.8	17.3	100.0	6.4
Other oaks	90.2	.0	55.6	51.6	7.4	.0	63.7	18.2	74.8	6.9
Black locust	59.1	.0	.0	90.7	18.1	.0	48.3	21.1	55.2	13.7
Basswood	100.0	.0	.0	.0	30.1	.0	100.0	16.3	80.2	14.6
Other hardwoods	36.2	92.9	61.5	47.7	11.1	.0	23.9	11.4	25.2	7.2
Total hardwoods	17.2	70.5	34.9	27.1	3.3	.0	14.2	3.7	22.4	1.8
All species	13.4	40.6	30.6	26.4	3.3	.0	14.1	3.7	21.6	1.7

Table 12.--Net volume of growing-stock trees on timberland by species and diameter class, Pennsylvania, 2002

(In millions of cubic feet)

Species	Diameter class (inches at breast height)										All classes	SE
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+		
White and red pine	65.0	111.4	102.2	117.4	132.4	72.9	71.9	36.6	120.6	48.3	878.6	11.6
Virginia pine	13.7	33.0	41.7	22.6	16.5	3.0	1.8	.0	.0	.0	132.2	24.1
Other yellow pines	14.3	27.1	26.6	41.4	13.9	18.7	1.6	9.0	.0	.0	152.6	16.0
Eastern hemlock	118.9	186.5	181.6	214.8	199.9	220.2	142.6	59.8	107.6	31.1	1,463.1	8.4
Other softwoods	24.4	40.7	30.7	22.5	3.0	3.9	.0	.0	10.1	.0	135.4	26.0
Total softwoods	236.4	398.7	382.7	418.7	365.7	318.8	217.9	105.4	238.3	79.4	2,761.9	6.2
Red maple	499.3	848.7	1,032.0	951.5	799.9	668.2	431.2	239.7	255.6	34.7	5,760.7	3.5
Sugar maple	146.2	260.3	376.3	395.4	312.3	248.1	149.8	96.2	125.1	37.2	2,146.9	6.7
Yellow birch	27.7	59.0	64.2	51.5	29.6	16.7	6.5	.0	2.5	.0	257.7	10.1
Sweet birch	130.2	247.7	287.9	227.7	123.4	81.1	42.4	29.1	18.9	.0	1,188.5	6.4
Hickory	35.9	77.9	110.1	122.9	115.8	42.4	77.3	24.8	53.8	.0	661.0	8.7
Beech	75.6	118.8	186.9	134.1	95.4	115.7	110.8	50.4	79.8	.0	967.5	7.8
White ash	74.9	129.8	188.3	213.8	232.3	226.4	125.4	84.8	93.3	23.1	1,392.2	7.4
Black walnut	6.0	16.5	24.0	15.2	9.4	16.3	7.3	7.0	6.6	.0	108.3	16.8
Yellow-poplar	23.7	54.6	89.8	115.0	145.0	198.0	162.9	98.4	310.9	24.2	1,222.4	10.0
Blackgum	43.6	42.7	41.2	29.7	14.7	7.6	5.3	9.6	5.5	.0	200.0	9.8
Aspen	24.7	42.8	62.0	42.3	40.8	11.8	2.6	6.8	9.1	.0	243.0	17.4
Black cherry	174.0	285.8	377.2	433.7	460.2	441.5	366.5	305.7	304.2	35.5	3,184.3	5.6
Chestnut oak	77.3	241.7	351.2	395.0	354.2	240.4	182.9	70.1	108.6	27.3	2,048.8	5.6
Northern red oak	56.8	121.1	217.5	333.0	388.8	378.9	428.6	302.4	407.1	107.5	2,741.7	5.3
Select white oaks	53.7	138.8	223.4	236.9	262.8	203.7	143.5	81.7	126.8	54.0	1,525.2	6.4
Other oaks	34.1	83.2	131.3	182.1	193.3	190.4	156.2	123.9	184.7	27.4	1,306.7	6.9
Black locust	18.9	36.7	37.5	28.5	32.7	31.7	22.9	17.3	6.8	.0	233.0	13.7
Basswood	8.9	29.2	56.0	75.8	91.9	80.8	36.9	11.5	9.3	12.7	412.9	14.6
Other hardwoods	61.1	126.2	182.5	168.0	128.2	104.4	66.6	29.7	53.7	12.8	933.3	7.2
Total hardwoods	1,572.7	2,961.7	4,039.5	4,152.1	3,830.7	3,304.0	2,525.6	1,589.1	2,162.2	396.4	26,534.0	1.8
All species	1,809.0	3,360.4	4,422.2	4,570.8	4,196.4	3,622.8	2,743.5	1,694.5	2,400.4	475.9	29,295.9	1.7
SE	2.3	2.2	2.1	2.4	2.9	3.3	4.0	5.5	5.9	14.0	1.7	

Table 12 (SE).--Net volume of growing-stock trees on timberland by species and diameter class, Pennsylvania, 2002

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)										All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	
White and red pine	15.6	16.8	15.7	19.1	20.3	21.0	21.0	33.4	22.6	41.5	11.6
Virginia pine	26.0	25.5	28.1	29.9	31.5	100.0	100.0	.0	.0	.0	24.1
Other yellow pines	23.6	23.0	21.3	18.3	33.9	32.9	100.0	51.2	.0	.0	16.0
Eastern hemlock	9.9	9.4	11.1	10.3	12.1	13.7	16.8	25.7	22.6	50.0	8.4
Other softwoods	26.4	30.9	34.1	32.4	70.7	72.7	.0	.0	73.4	.0	26.0
Total softwoods	7.6	7.7	8.1	8.0	10.1	11.1	13.4	19.0	15.8	31.9	6.2
Red maple	3.7	3.9	4.4	5.1	6.4	7.1	8.9	14.5	15.3	54.2	3.5
Sugar maple	6.7	6.9	8.2	9.7	10.4	11.9	15.5	21.8	23.8	50.4	6.7
Yellow birch	12.7	14.1	13.3	18.2	25.6	33.9	58.8	.0	100.0	.0	10.1
Sweet birch	8.5	8.6	8.6	9.4	14.6	17.0	27.1	31.6	50.2	.0	6.4
Hickory	10.5	12.4	11.6	13.9	14.4	24.1	20.4	38.4	30.3	.0	8.7
Beech	9.9	10.2	9.7	11.8	14.9	15.7	20.0	26.9	26.6	.0	7.8
White ash	9.7	8.7	9.1	10.0	11.4	13.6	19.7	24.2	27.9	77.8	7.4
Black walnut	21.2	23.3	20.8	33.1	44.0	37.1	58.1	71.5	70.7	.0	16.8
Yellow-poplar	19.1	18.8	15.1	15.2	16.8	15.7	17.7	24.3	17.4	71.6	10.0
Blackgum	10.0	12.1	14.2	22.5	32.3	50.2	70.8	59.3	100.0	.0	9.8
Aspen	17.5	18.8	22.3	25.8	23.5	45.8	100.0	100.0	100.0	.0	17.4
Black cherry	8.4	7.1	7.2	8.4	9.6	9.7	11.9	15.7	15.2	50.7	5.6
Chestnut oak	9.6	8.2	7.0	7.2	8.9	10.6	12.9	19.9	25.0	51.2	5.6
Northern red oak	8.2	8.0	8.4	8.0	8.4	9.0	10.2	11.8	13.5	28.7	5.3
Select white oaks	10.9	9.4	8.4	9.7	11.0	11.6	16.2	20.4	20.4	45.6	6.4
Other oaks	11.6	10.5	9.9	10.0	10.5	13.3	14.4	18.1	18.3	57.8	6.9
Black locust	16.8	17.0	17.7	20.4	24.7	28.1	33.8	44.9	74.9	.0	13.7
Basswood	24.2	18.7	18.4	22.3	20.6	22.7	32.7	58.5	59.4	75.6	14.6
Other hardwoods	12.3	9.3	10.1	11.3	13.3	15.2	21.7	33.7	36.4	76.1	7.2
Total hardwoods	2.4	2.3	2.2	2.5	3.0	3.4	4.2	5.7	6.4	15.6	1.8
All species	2.3	2.2	2.1	2.4	2.9	3.3	4.0	5.5	5.9	14.0	1.7

Table 13.--Net volume of sawtimber trees on timberland by species and forest-type group, Pennsylvania, 2002

(In millions of board feet)

Species	Forest-type group									Total	SE
	White/ red pine	Spruce/ fir	Loblolly/ shortleaf	Oak/ pine	Oak/ hickory	Oak/gum/ cypress	Elm/ash/ red maple	Northern hardwoods	Aspen/ birch		
White and red pine	1,410.0	2.0	15.5	337.2	615.9	.0	40.1	714.3	31.9	3,166.9	13.4
Virginia pine	.0	5.0	169.5	30.4	43.7	.0	3.6	49.4	.0	301.6	26.9
Other yellow pines	59.2	.0	74.6	88.0	153.0	.0	11.8	41.7	2.3	430.6	17.4
Eastern hemlock	1,790.3	.0	.0	20.3	353.8	.0	14.5	2,364.9	.0	4,543.9	9.4
Other softwoods	7.0	128.5	.0	.0	36.3	.0	.0	90.6	.0	262.3	26.9
Total softwoods	3,266.5	135.6	259.5	475.8	1,202.7	.0	70.1	3,260.9	34.2	8,705.3	7.3
Red maple	214.0	.0	.0	39.0	4,388.0	.0	1,761.1	7,827.5	13.5	14,243.0	4.9
Sugar maple	34.1	.0	.0	7.8	381.8	.0	34.1	5,222.6	.0	5,680.4	8.4
Yellow birch	48.8	.0	.0	.0	18.4	.0	5.6	338.8	.0	411.7	15.0
Sweet birch	42.4	.0	.0	.0	497.1	.0	21.0	1,575.2	2.2	2,137.8	9.2
Hickory	16.7	.0	.0	4.7	1,435.1	.0	30.6	357.2	3.6	1,847.8	10.4
Beech	55.2	.0	.0	.0	500.1	.0	.0	2,113.8	.0	2,669.1	10.5
White ash	48.0	4.3	6.0	32.5	1,085.7	.0	234.1	2,994.3	11.5	4,416.5	9.7
Black walnut	.0	.0	2.7	.0	206.3	.0	26.4	12.5	.0	247.8	23.6
Yellow-poplar	159.9	.0	.0	.0	3,462.8	.0	48.2	1,347.6	9.6	5,028.1	11.1
Blackgum	.0	.0	.0	.0	247.5	.0	.0	45.9	.0	293.4	21.3
Aspen	25.9	12.3	.0	.0	39.0	.0	110.0	198.6	122.9	508.7	24.0
Black cherry	177.7	5.5	.0	15.9	1,282.7	.0	319.9	8,752.6	50.8	10,605.1	7.1
Chestnut oak	22.3	.0	.0	44.9	4,981.6	.0	.0	280.7	3.6	5,333.0	6.8
Northern red oak	111.7	.0	.0	74.5	8,745.6	.0	35.0	1,376.5	13.8	10,357.0	6.0
Select white oaks	101.9	.0	.0	42.7	4,201.3	.0	28.3	444.9	2.3	4,821.4	7.7
Other oaks	23.8	.0	.0	45.5	4,210.8	.0	14.7	210.3	33.9	4,539.0	8.0
Black locust	.0	.0	.0	5.2	400.9	.0	44.3	88.5	.0	539.0	18.3
Basswood	4.3	.0	.0	.0	116.6	.0	.0	1,294.7	9.9	1,425.5	15.6
Other hardwoods	49.7	3.1	.0	10.3	835.6	.0	525.4	915.9	149.5	2,489.5	9.5
Total hardwoods	1,136.3	25.2	8.7	322.8	37,036.8	.0	3,238.7	35,398.0	427.3	77,593.9	2.4
All species	4,402.8	160.7	268.2	798.7	38,239.6	.0	3,308.8	38,658.9	461.5	86,299.1	2.3
SE	14.9	42.5	32.9	27.9	4.0	.0	16.5	4.3	25.4	2.3	

Table 13 (SE).--Net volume of sawtimber trees on timberland by species and forest-type group, Pennsylvania, 2002

(Standard error as percentage of total)

Species	Forest-type group									Total
	White/ red pine	Spruce/ fir	Loblolly/ shortleaf	Oak/ pine	Oak/ hickory	Oak/gum/ cypress	Elm/ash/ red maple	Northern hardwoods	Aspen/ birch	
White and red pine	25.1	100.0	71.2	36.7	17.3	.0	78.2	23.3	62.3	13.4
Virginia pine	.0	100.0	42.9	73.0	44.1	.0	100.0	42.8	.0	26.9
Other yellow pines	40.8	.0	44.6	56.0	23.3	.0	82.3	35.8	100.0	17.4
Eastern hemlock	18.6	.0	.0	100.0	24.1	.0	70.7	11.0	.0	9.4
Other softwoods	66.8	42.4	.0	.0	51.4	.0	.0	45.5	.0	26.9
Total softwoods	15.7	42.3	33.4	30.1	12.1	.0	49.4	9.8	58.5	7.3
Red maple	28.2	.0	.0	50.4	8.3	.0	21.3	6.9	61.9	4.9
Sugar maple	74.2	.0	.0	100.0	20.7	.0	66.9	9.0	.0	8.4
Yellow birch	43.2	.0	.0	.0	51.6	.0	100.0	16.9	.0	15.0
Sweet birch	80.3	.0	.0	.0	13.9	.0	53.9	11.6	100.0	9.2
Hickory	60.7	.0	.0	100.0	12.6	.0	58.4	19.1	100.0	10.4
Beech	64.8	.0	.0	.0	21.3	.0	.0	12.2	.0	10.5
White ash	67.1	100.0	100.0	58.0	16.5	.0	47.2	12.6	70.9	9.7
Black walnut	.0	.0	100.0	.0	26.4	.0	76.0	51.4	.0	23.6
Yellow-poplar	52.6	.0	.0	.0	14.2	.0	62.8	19.2	71.9	11.1
Blackgum	.0	.0	.0	.0	24.2	.0	.0	40.0	.0	21.3
Aspen	59.8	100.0	.0	.0	61.7	.0	81.7	24.3	48.9	24.0
Black cherry	48.4	100.0	.0	100.0	12.7	.0	35.8	8.4	56.4	7.1
Chestnut oak	47.9	.0	.0	64.6	7.2	.0	.0	23.4	100.0	6.8
Northern red oak	44.1	.0	.0	45.1	6.9	.0	46.8	13.5	85.1	6.0
Select white oaks	44.0	.0	.0	83.0	8.5	.0	82.3	20.0	100.0	7.7
Other oaks	100.0	.0	.0	64.2	8.6	.0	70.7	23.4	87.1	8.0
Black locust	.0	.0	.0	100.0	22.4	.0	74.2	29.6	.0	18.3
Basswood	100.0	.0	.0	.0	40.6	.0	.0	16.8	100.0	15.6
Other hardwoods	49.0	100.0	.0	100.0	14.1	.0	30.0	14.2	36.3	9.5
Total hardwoods	21.3	100.0	75.7	30.5	4.0	.0	16.7	4.4	26.4	2.4
All species	14.9	42.5	32.9	27.9	4.0	.0	16.5	4.3	25.4	2.3

Table 14.--Net volume of sawtimber trees on timberland by species and diameter class, Pennsylvania, 2002

(In millions of board feet)

Species	Diameter class (inches at breast height)								All classes	SE
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+		
White and red pine	352.1	486.2	600.2	339.1	349.2	178.1	634.2	227.7	3,166.9	13.4
Virginia pine	134.4	83.1	63.2	11.8	9.2	.0	.0	.0	301.6	26.9
Other yellow pines	86.7	155.8	55.0	83.5	8.1	41.4	.0	.0	430.6	17.4
Eastern hemlock	539.5	770.2	788.1	918.3	589.6	263.1	522.2	153.0	4,543.9	9.4
Other softwoods	99.3	85.8	11.8	17.1	.0	.0	48.4	.0	262.3	26.9
Total softwoods	1,212.0	1,581.2	1,518.2	1,369.8	956.0	482.7	1,204.8	380.7	8,705.3	7.3
Red maple	.0	3,574.0	3,304.1	2,905.8	1,910.4	1,136.2	1,182.0	230.4	14,243.0	4.9
Sugar maple	.0	1,492.7	1,267.6	1,067.1	660.8	443.2	556.6	192.5	5,680.4	8.4
Yellow birch	.0	193.3	119.9	65.5	22.7	.0	10.3	.0	411.7	15.0
Sweet birch	.0	880.9	522.1	347.3	186.5	117.3	83.7	.0	2,137.8	9.2
Hickory	.0	464.5	487.7	181.6	356.4	110.5	247.1	.0	1,847.8	10.4
Beech	.0	543.5	427.6	526.1	531.3	229.9	410.7	.0	2,669.1	10.5
White ash	.0	840.4	986.7	1,012.2	593.4	405.3	453.7	124.7	4,416.5	9.7
Black walnut	.0	55.4	38.5	61.4	33.7	32.0	26.8	.0	247.8	23.6
Yellow-poplar	.0	443.3	619.2	915.9	797.4	481.8	1,633.5	137.0	5,028.1	11.1
Blackgum	.0	100.0	56.9	32.5	24.4	46.9	32.7	.0	293.4	21.3
Aspen	.0	177.4	182.0	53.5	9.0	36.5	50.4	.0	508.7	24.0
Black cherry	.0	1,636.7	1,908.7	1,999.7	1,740.6	1,543.9	1,579.4	196.1	10,605.1	7.1
Chestnut oak	.0	1,434.4	1,329.7	946.9	740.2	283.3	477.0	121.4	5,333.0	6.8
Northern red oak	.0	1,260.8	1,587.2	1,612.8	1,937.3	1,399.4	1,978.0	581.6	10,357.0	6.0
Select white oaks	.0	929.8	1,112.2	900.7	640.8	370.0	564.9	303.0	4,821.4	7.7
Other oaks	.0	675.6	801.2	794.3	692.7	571.1	870.5	133.6	4,539.0	8.0
Black locust	.0	94.1	126.1	116.0	95.7	74.3	32.7	.0	539.0	18.3
Basswood	.0	279.7	396.2	377.2	175.4	59.0	49.5	88.5	1,425.5	15.6
Other hardwoods	.0	665.4	559.3	461.5	325.7	128.4	258.2	91.1	2,489.5	9.5
Total hardwoods	.0	15,741.9	15,833.0	14,377.9	11,474.3	7,469.1	10,497.8	2,199.8	77,593.9	2.4
All species	1,212.0	17,323.0	17,351.2	15,747.7	12,430.3	7,951.8	11,702.6	2,580.5	86,299.1	2.3
SE	8.2	2.4	2.9	3.4	4.1	5.7	6.1	14.5	2.3	

Table 14 (SE).--Net volume of sawtimber trees on timberland by species and diameter class, Pennsylvania, 2002

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)								All classes
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	
White and red pine	16.1	20.0	20.8	21.7	21.1	34.3	23.1	41.3	13.4
Virginia pine	27.6	30.1	31.6	100.0	100.0	.0	.0	.0	26.9
Other yellow pines	21.2	18.6	35.1	33.2	100.0	51.2	.0	.0	17.4
Eastern hemlock	11.0	10.8	12.4	13.8	16.6	26.2	22.7	50.1	9.4
Other softwoods	33.5	32.1	70.8	72.9	.0	.0	74.6	.0	26.9
Total softwoods	8.2	8.5	10.6	11.3	13.3	19.5	16.0	31.8	7.3
Red maple	.0	5.1	6.5	7.2	9.0	14.7	15.3	57.9	4.9
Sugar maple	.0	9.8	10.5	12.3	15.4	22.5	25.4	52.2	8.4
Yellow birch	.0	17.9	26.3	34.4	62.6	.0	100.0	.0	15.0
Sweet birch	.0	9.5	15.1	17.7	27.4	32.2	51.5	.0	9.2
Hickory	.0	13.6	14.6	24.3	20.6	38.9	30.1	.0	10.4
Beech	.0	11.9	15.0	16.1	19.4	27.3	26.5	.0	10.5
White ash	.0	10.1	11.8	14.0	20.6	24.8	28.3	76.5	9.7
Black walnut	.0	34.6	45.3	37.7	58.8	71.5	71.1	.0	23.6
Yellow-poplar	.0	15.0	16.9	15.8	17.7	24.4	17.8	70.9	11.1
Blackgum	.0	22.4	32.4	50.3	70.8	60.4	100.0	.0	21.3
Aspen	.0	25.5	23.6	45.4	100.0	100.0	100.0	.0	24.0
Black cherry	.0	8.6	9.9	10.0	12.2	16.3	15.7	50.5	7.1
Chestnut oak	.0	7.3	9.0	10.6	13.0	20.2	25.7	50.7	6.8
Northern red oak	.0	8.3	8.6	9.1	10.3	11.9	13.7	29.6	6.0
Select white oaks	.0	9.8	11.1	11.8	16.7	20.4	20.7	47.9	7.7
Other oaks	.0	10.1	10.6	13.3	14.5	18.5	18.6	58.8	8.0
Black locust	.0	21.2	24.9	27.2	32.9	44.5	80.2	.0	18.3
Basswood	.0	21.9	20.3	22.8	33.0	58.9	57.9	73.2	15.6
Other hardwoods	.0	11.8	13.4	15.5	22.1	33.9	35.8	72.0	9.5
Total hardwoods	.0	2.5	3.1	3.5	4.3	5.9	6.5	16.2	2.4
All species	8.2	2.4	2.9	3.4	4.1	5.7	6.1	14.5	2.3

Table 15.--Sound biomass[a] of trees on forest land by species and compon, Pennsylvania, 2002

(In thousands of dry tons)

Species	Component									All classes	SE
	Main stem	Branches	Foliage	Stumps/ roots	Growing stock	Cull	All live	Salvable dead	Saplings		
White and red pine	14,069	2,670	1,747	4,791	23,278	1,567	24,845	141	1,915	26,902	10.0
Virginia pine	2,442	456	329	825	4,052	198	4,250	57	243	4,549	22.0
Other yellow pines	3,142	593	414	1,071	5,220	514	5,734	64	474	6,272	15.5
Eastern hemlock	25,577	4,819	3,234	8,671	42,302	6,621	48,923	443	3,150	52,516	7.4
Other softwoods	2,481	465	341	843	4,131	239	4,369	35	713	5,117	22.3
Total softwoods	47,712	9,004	6,065	16,202	78,983	9,140	88,122	740	6,495	95,357	5.3
Red maple	132,945	16,175	4,581	40,664	194,366	11,222	205,588	486	18,137	224,211	3.0
Sugar maple	63,641	7,670	2,151	19,327	92,789	4,097	96,887	66	4,543	101,496	5.9
Yellow birch	6,955	872	258	2,170	10,255	1,338	11,593	222	718	12,533	9.5
Sweet birch	34,031	4,193	1,227	10,465	49,917	3,235	53,152	373	7,534	61,059	5.5
Hickory	20,201	2,355	649	5,957	29,163	632	29,795	180	1,410	31,385	8.1
Beech	28,062	3,502	990	8,806	41,360	4,581	45,941	122	4,219	50,282	6.7
White ash	34,103	4,007	1,103	10,136	49,349	3,922	53,271	462	2,051	55,785	6.2
Black walnut	2,999	355	100	893	4,347	495	4,843	10	383	5,237	14.8
Yellow-poplar	21,081	2,300	572	5,942	29,896	502	30,397	58	893	31,349	9.7
Blackgum	6,466	811	243	2,014	9,534	543	10,077	1	3,602	13,681	8.4
Aspen	5,467	661	193	1,652	7,974	52	8,026	77	877	8,980	15.2
Black cherry	76,387	8,847	2,373	22,499	110,107	7,655	117,761	322	7,710	125,793	4.9
Chestnut oak	72,673	8,448	2,320	21,383	104,824	5,023	109,847	434	1,045	111,326	5.4
Northern red oak	101,241	11,136	2,787	28,719	143,883	1,794	145,677	183	1,757	147,617	5.1
Select white oaks	46,911	5,305	1,403	13,536	67,155	3,113	70,268	251	951	71,469	6.5
Other oaks	39,079	4,406	1,143	11,283	55,911	1,411	57,322	437	697	58,456	6.4
Black locust	6,739	874	242	2,206	10,060	2,565	12,625	97	685	13,407	11.9
Basswood	9,225	1,090	291	2,773	13,379	650	14,029	13	263	14,306	13.4
Other hardwoods	23,927	2,849	793	7,191	34,761	3,462	38,223	484	3,338	42,045	7.0
Other noncomm hardwoods	0	0	0	0	0	23,393	23,393	0	11,807	35,201	4.9
Total hardwoods	732,135	85,857	23,421	217,618	1,059,031	79,686	1,138,717	4,279	72,623	1,215,618	1.5
All species	779,846	94,861	29,486	233,820	1,138,013	88,825	1,226,839	5,019	79,118	1,310,975	1.4
SE	1.6	1.5	1.6	1.5	1.6	3.5	1.5	9.3	2.9	1.4	

[a] Dead tree and sapling biomass is aboveground tree biomass.

Table 15 (SE).--Sound biomass[a] of trees on forest land by species and c, Pennsylvania, 2002

(Standard error as percentage of total)

Species	Component									All classes
	Main stem	Branches	Foliage	Stumps/ roots	Growing stock	Cull	All live	Salvable dead	Saplings	
White and red pine	10.9	10.9	10.7	10.9	10.9	20.0	10.5	30.7	18.0	10.0
Virginia pine	23.2	23.1	22.8	23.1	23.1	40.0	22.8	45.9	52.9	22.0
Other yellow pines	16.4	16.4	16.3	16.4	16.4	35.0	16.3	44.9	39.1	15.5
Eastern hemlock	7.9	7.9	7.7	7.9	7.9	12.9	7.5	38.8	14.4	7.4
Other softwoods	25.4	25.3	25.5	25.3	25.4	30.1	24.4	75.5	28.4	22.3
Total softwoods	5.8	5.8	5.6	5.8	5.8	10.2	5.5	24.8	10.0	5.3
Red maple	3.2	3.1	3.0	3.2	3.2	7.9	3.1	21.9	5.8	3.0
Sugar maple	6.2	6.1	5.9	6.1	6.1	13.9	6.1	50.0	9.4	5.9
Yellow birch	9.9	9.7	9.5	9.7	9.8	21.3	9.8	42.3	22.0	9.5
Sweet birch	6.2	6.1	6.1	6.1	6.2	17.6	6.1	28.0	9.2	5.5
Hickory	8.4	8.1	7.9	8.2	8.3	33.4	8.3	67.8	13.4	8.1
Beech	7.1	7.0	6.8	7.0	7.1	15.0	7.0	59.1	10.0	6.7
White ash	6.6	6.5	6.2	6.5	6.6	19.2	6.4	27.0	13.0	6.2
Black walnut	16.2	15.7	15.2	15.9	16.0	27.0	15.1	100.0	35.9	14.8
Yellow-poplar	9.8	9.6	9.4	9.7	9.7	48.9	9.8	57.7	23.7	9.7
Blackgum	9.4	9.1	8.8	9.2	9.3	30.9	9.3	100.0	12.2	8.4
Aspen	16.5	16.1	15.8	16.2	16.4	48.3	16.3	44.0	26.6	15.2
Black cherry	5.3	5.2	5.0	5.2	5.3	12.4	5.1	31.6	9.9	4.9
Chestnut oak	5.6	5.4	5.4	5.5	5.5	14.3	5.4	35.4	20.7	5.4
Northern red oak	5.3	5.1	4.9	5.2	5.2	27.3	5.2	40.3	15.0	5.1
Select white oaks	6.7	6.5	6.2	6.5	6.6	25.8	6.6	41.6	20.1	6.5
Other oaks	6.7	6.5	6.2	6.5	6.6	23.8	6.5	44.5	19.9	6.4
Black locust	13.8	13.1	12.5	13.2	13.5	18.2	12.4	47.7	23.9	11.9
Basswood	13.9	13.8	13.6	13.8	13.9	39.4	13.5	82.5	44.5	13.4
Other hardwoods	7.3	7.0	6.7	7.1	7.2	32.3	7.4	26.0	11.9	7.0
Other noncomm hardwoods	.0	.0	.0	.0	.0	6.2	6.2	.0	6.6	4.9
Total hardwoods	1.7	1.6	1.5	1.6	1.7	3.8	1.6	10.0	3.0	1.5
All species	1.6	1.5	1.6	1.5	1.6	3.5	1.5	9.3	2.9	1.4

[a] Dead tree and sapling biomass is aboveground tree biomass.

Table 1.--Land area by land class, Pennsylvania, 1989[a,b]

(In thousands of acres)

Land class	Area		
	Acres	Percent	
Rural timberland	16,030.3	55.9	.7
Urban timberland[c]	141.2	0.5	18.5
Total timberland	16,171.5	56.4	.7
Reserved forest[d]	448.3	1.6	10.8
Unproductive forest	83.6	0.3	25.2
Total forest land	16,703.4	58.2	.6
Cropland	4,923.9	17.2	2.5
Pasture	1,362.3	4.7	5.9
Christmas tree plantation[e]	67.5	0.2	28.7
Noncensus water	81.9	0.3	25.8
Other	5,543.7	19.3	2.4
Total nonforest land	11,979.2	41.8	.8
Total area[f]	28,682.6	100.0	.0
SE	.0	.0	

[a] In this and other tables, a zero indicates that the data are negligible or the condition was not encountered in the sample.

[b] Rows and columns in all tables may not sum due to rounding.

[c] Urban timberland previously classified as urban forest land (not part of the timberland estimate).

[d] Reserve lands are estimated.

[e] Christmas tree plantations previously classified as forest land.

[f] Source: U.S. Department of Commerce, Bureau of Census, 2000.

Table 2.--Area of forest land by forest type, forest-type group, and stand-size class, Pennsylvania, 1989

(In thousands of acres)

Forest type	Stand-size class				All classes	SE
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked		
Jack pine	.0	5.6	.0	.0	5.6	100.0
Red pine	15.3	20.1	5.6	.0	41.1	34.9
White pine	50.4	16.1	36.5	6.6	109.6	22.4
White pine/hemlock	46.2	5.9	.0	.0	52.1	31.8
Hemlock	249.7	16.2	.0	.0	265.9	13.8
Scotch pine	9.9	38.4	5.5	.0	53.8	31.8
White/red pine group	371.5	102.4	47.6	6.6	528.2	9.7
White spruce	.0	11.8	.0	.0	11.8	70.8
Norway spruce	.0	16.3	.0	.0	16.3	57.8
Tamarack	.0	.0	11.0	.0	11.0	70.7
Spruce/fir group	.0	28.2	11.0	.0	39.2	37.9
Virginia pine	43.6	22.5	5.2	.0	71.3	26.0
Eastern redcedar	5.9	.0	6.0	.0	11.9	70.7
Pitch pine	10.6	11.2	.0	.0	21.8	48.8
Loblolly/shortleaf group	60.1	33.7	11.2	.0	104.9	21.9
Wh. pine/no.red oak/wh. ash	45.0	10.6	5.5	.0	61.1	29.8
Eastern redcedar/hardwood	.0	.0	17.2	.0	17.2	57.8
Virginia pine/oak	14.7	21.2	5.2	.0	41.1	35.5
Other oak/pine	10.4	33.9	.0	.0	44.3	35.4
Oak/pine group	70.1	65.8	27.9	.0	163.7	18.2
Post, black, or bear oak	65.2	.0	22.3	.0	87.5	25.1
Chestnut oak	297.0	393.3	50.7	.0	741.0	8.2
White oak/red oak/hickory	414.9	221.4	16.5	.0	652.7	9.0
White oak	97.7	166.6	11.3	.0	275.7	14.0
Northern red oak	282.2	75.9	10.1	.0	368.3	11.6
Y-poplar/wh. oak/no.red oak	45.1	5.1	.0	.0	50.2	32.6
Black locust	5.6	44.9	26.7	16.4	93.6	24.1
Black walnut	.0	22.8	.0	.0	22.8	47.1
Yellow-poplar	27.9	10.5	11.5	.0	49.8	33.4
Hawthorn/reverting field	.0	6.5	77.0	5.5	89.0	25.1
Scarlet oak	29.0	16.7	.0	.0	45.7	35.6
Sassafras/persimmon	.0	27.8	43.3	.0	71.0	27.8
Red maple/central hardwood	110.3	254.1	50.4	.0	414.8	11.4
Mixed central hardwoods	2,457.9	1,819.6	593.1	.0	4,870.6	2.7

Table 2.-continued

(In thousands of acres)

Forest type	Stand-size class				All classes	SE
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked		
Oak/hickory group	3,832.9	3,065.3	912.8	21.9	7,832.9	1.8
Sweetbay/swamp tupelo/red mple	.0	5.5	.0	.0	5.5	100.0
Oak/gum/cypress group	.0	5.5	.0	.0	5.5	100.0
Black ash/Amer. elm/red maple	101.7	47.7	73.3	5.6	228.3	15.3
Red maple(lowland)	.0	15.7	17.3	.0	33.0	41.2
Red maple(upland)	96.7	97.8	50.2	21.5	266.2	14.2
River birch/sycamore	43.5	11.4	5.4	.0	60.3	30.2
Cottonwood	.0	11.1	.0	.0	11.1	71.0
Willow	11.0	5.3	66.9	.0	83.3	23.7
Sycamore/pecan/American elm	17.1	.0	.0	.0	17.1	57.8
American elm/green ash	6.1	22.0	5.6	.0	33.7	40.9
Elm/ash/red maple group	276.1	210.9	218.8	27.1	732.9	8.4
Sugar maple/beech/yellow birch	1,783.7	655.0	128.5	9.9	2,577.1	3.8
Black cherry	238.5	314.5	385.8	5.6	944.4	7.1
Red maple/northern hardwoods	530.0	600.5	193.1	.0	1,323.6	6.0
Pin cherry/reverting field	5.7	26.8	168.8	10.4	211.6	15.8
Mixed northern hardwoods	763.7	689.9	433.5	5.8	1,892.9	5.1
Northern hardwoods group	3,321.6	2,286.6	1,309.6	31.7	6,949.5	2.0
Aspen	14.6	196.4	76.3	.0	287.3	13.7
Paper birch	.0	16.4	.0	.0	16.4	56.7
Gray birch	.0	.0	32.6	.0	32.6	40.7
Aspen/birch group	14.6	212.8	108.8	.0	336.3	12.6
Nonstocked	.0	.0	.0	10.4	10.4	71.2
All forest types	7,947.0	6,011.1	2,647.6	97.7	16,703.4	.6
SE	1.8	2.4	3.9	23.6	.6	

Table 2 (SE).--Area of forest land by forest type, forest-type group, and stand-size class, Pennsylvania, 1989
(Standard error as percentage of total)

Forest type	Stand-size class				All classes
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked	
Jack pine	.0	100.0	.0	.0	100.0
Red pine	54.8	50.5	100.0	.0	34.9
White pine	33.4	57.8	38.0	100.0	22.4
White pine/hemlock	34.3	100.0	.0	.0	31.8
Hemlock	14.3	57.8	.0	.0	13.8
Scotch pine	71.1	38.0	100.0	.0	31.8
White/red pine group	11.6	23.1	33.5	100.0	9.7
White spruce	.0	70.8	.0	.0	70.8
Norway spruce	.0	57.8	.0	.0	57.8
Tamarack	.0	.0	70.7	.0	70.7
Spruce/fir group	.0	44.8	70.7	.0	37.9
Virginia pine	33.6	50.0	100.0	.0	26.0
Eastern redcedar	100.0	.0	100.0	.0	70.7
Pitch pine	70.8	71.0	.0	.0	48.8
Loblolly/shortleaf group	29.1	40.9	70.9	.0	21.9
Wh. pine/no.red oak/wh. ash	34.8	70.7	100.0	.0	29.8
Eastern redcedar/hardwood	.0	.0	57.8	.0	57.8
Virginia pine/oak	58.1	50.2	100.0	.0	35.5
Other oak/pine	70.7	40.8	.0	.0	35.4
Oak/pine group	27.5	28.9	44.8	.0	18.2
Post, black, or bear oak	29.0	.0	50.0	.0	25.1
Chestnut oak	13.3	11.7	32.4	.0	8.2
White oak/red oak/hickory	11.2	15.7	57.9	.0	9.0
White oak	23.3	18.1	70.7	.0	14.0
Northern red oak	13.4	26.3	71.1	.0	11.6
Y-poplar/wh. oak/no.red oak	34.5	100.0	.0	.0	32.6
Black locust	100.0	35.4	44.8	57.7	24.1
Black walnut	.0	47.1	.0	.0	47.1
Yellow-poplar	44.8	70.8	70.8	.0	33.4
Hawthorn/reverting field	.0	100.0	26.8	100.0	25.1
Scarlet oak	45.2	57.7	.0	.0	35.6
Sassafras/persimmon	.0	44.7	35.4	.0	27.8
Red maple/central hardwood	22.3	14.5	33.5	.0	11.4
Mixed central hardwoods	4.2	5.1	9.3	.0	2.7

Table 2 (SE).-continued

(Standard error as percentage of total)

Forest type	Stand-size class				All classes
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked	
Oak/hickory group	3.1	3.7	7.3	49.7	1.8
Sweetbay/swamp tupelo/red mple	.0	100.0	.0	.0	100.0
Oak/gum/cypress group	.0	100.0	.0	.0	100.0
Black ash/Amer. elm/red maple	22.7	33.4	27.8	100.0	15.3
Red maple(lowland)	.0	58.2	58.1	.0	41.2
Red maple(upland)	23.2	23.6	33.4	50.0	14.2
River birch/sycamore	35.5	70.7	100.0	.0	30.2
Cottonwood	.0	71.0	.0	.0	71.0
Willow	70.7	100.0	25.9	.0	23.7
Sycamore/pecan/American elm	57.8	.0	.0	.0	57.8
American elm/green ash	100.0	50.0	100.0	.0	40.9
Elm/ash/red maple group	13.6	16.0	15.4	44.7	8.4
Sugar maple/beech/yellow birch	4.9	8.7	20.5	71.1	3.8
Black cherry	14.5	12.8	11.5	100.0	7.1
Red maple/northern hardwoods	9.7	9.2	16.2	.0	6.0
Pin cherry/reverting field	100.0	44.8	18.0	70.7	15.8
Mixed northern hardwoods	8.2	8.7	11.2	100.0	5.1
Northern hardwoods group	3.4	4.4	6.0	41.0	2.0
Aspen	59.3	16.7	26.3	.0	13.7
Paper birch	.0	56.7	.0	.0	56.7
Gray birch	.0	.0	40.7	.0	40.7
Aspen/birch group	59.3	16.0	21.8	.0	12.6
Nonstocked	.0	.0	.0	71.2	71.2
All forest types	1.8	2.4	3.9	23.6	.6

Table 3.--Area of timberland by forest type, forest-type group, and stand-size class, Pennsylvania, 1989

(In thousands of acres)

Forest type	Stand-size class				All classes	SE
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked		
Jack pine	.0	5.6	.0	.0	5.6	100.0
Red pine	15.3	20.1	5.6	.0	41.1	34.9
White pine	50.4	16.1	32.0	.0	98.4	23.6
White pine/hemlock	46.2	5.9	.0	.0	52.1	31.8
Hemlock	249.7	16.2	.0	.0	265.9	13.8
Scotch pine	9.9	38.4	5.5	.0	53.8	31.8
White/red pine group	371.5	102.4	43.1	.0	517.0	9.8
White spruce	.0	5.6	.0	.0	5.6	100.0
Norway spruce	.0	11.3	.0	.0	11.3	70.7
Tamarack	.0	.0	11.0	.0	11.0	70.7
Spruce/fir group	.0	16.9	11.0	.0	27.9	44.7
Virginia pine	43.6	22.5	5.2	.0	71.3	26.0
Eastern redcedar	5.9	.0	6.0	.0	11.9	70.7
Pitch pine	10.6	11.2	.0	.0	21.8	48.8
Loblolly/shortleaf group	60.1	33.7	11.2	.0	104.9	21.9
Wh. pine/no.red oak/wh. ash	45.0	10.6	5.5	.0	61.1	29.8
Eastern redcedar/hardwood	.0	.0	11.1	.0	11.1	70.7
Virginia pine/oak	14.7	21.2	5.2	.0	41.1	35.5
Other oak/pine	10.4	33.9	.0	.0	44.3	35.4
Oak/pine group	70.1	65.8	21.8	.0	157.6	18.5
Post, black, or bear oak	65.2	.0	22.3	.0	87.5	25.1
Chestnut oak	280.9	370.4	45.1	.0	696.4	8.5
White oak/red oak/hickory	386.5	216.0	11.6	.0	614.1	9.3
White oak	97.7	166.6	5.5	.0	269.9	14.1
Northern red oak	265.3	75.9	10.1	.0	351.3	11.9
Y-poplar/wh. oak/no.red oak	45.1	5.1	.0	.0	50.2	32.6
Black locust	5.6	44.9	26.7	16.4	93.6	24.1
Black walnut	.0	22.8	.0	.0	22.8	47.1
Yellow-poplar	22.5	10.5	11.5	.0	44.4	35.4
Hawthorn/reverting field	.0	6.5	72.4	5.5	84.5	25.9
Scarlet oak	29.0	16.7	.0	.0	45.7	35.6
Sassafras/persimmon	.0	27.8	43.3	.0	71.0	27.8
Red maple/central hardwood	110.3	248.7	50.4	.0	409.4	11.5
Mixed central hardwoods	2,397.5	1,765.0	572.2	.0	4,734.7	2.8

Table 3.-continued

(In thousands of acres)

Forest type	Stand-size class				All classes	SE
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked		
Oak/hickory group	3,705.6	2,977.0	871.1	21.9	7,575.6	1.8
Black ash/Amer. elm/red maple	96.6	47.7	61.4	5.6	211.2	15.9
Red maple(lowland)	.0	15.7	12.2	.0	27.8	45.1
Red maple(upland)	96.7	97.8	50.2	15.9	260.6	14.4
River birch/sycamore	43.5	5.6	.0	.0	49.1	33.4
Cottonwood	.0	11.1	.0	.0	11.1	71.0
Willow	11.0	5.3	61.4	.0	77.7	24.4
Sycamore/pecan/American elm	17.1	.0	.0	.0	17.1	57.8
American elm/green ash	6.1	22.0	5.6	.0	33.7	40.9
Elm/ash/red maple group	271.0	205.1	190.7	21.5	688.3	8.6
Sugar maple/beech/yellow birch	1,739.4	616.7	128.5	9.9	2,494.5	3.9
Black cherry	232.5	314.5	380.0	5.6	932.6	7.2
Red maple/northern hardwoods	519.3	583.9	187.5	.0	1,290.7	6.1
Pin cherry/reverting field	5.7	26.8	168.8	10.4	211.6	15.8
Mixed northern hardwoods	748.4	668.0	433.5	5.8	1,855.7	5.2
Northern hardwoods group	3,245.3	2,209.8	1,298.3	31.7	6,785.1	2.1
Aspen	14.6	196.4	70.6	.0	281.7	13.8
Paper birch	.0	16.4	.0	.0	16.4	56.7
Gray birch	.0	.0	17.0	.0	17.0	57.8
Aspen/birch group	14.6	212.8	87.6	.0	315.1	13.0
All forest types	7,738.2	5,823.5	2,534.6	75.1	16,171.5	.7
SE	1.8	2.5	4.0	26.7	.7	

Table 3 (SE).--Area of timberland by forest type, forest-type group, and stand-size class, Pennsylvania, 1989

(Standard error as percentage of total)

Forest type	Stand-size class				All classes
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked	
Jack pine	.0	100.0	.0	.0	100.0
Red pine	54.8	50.5	100.0	.0	34.9
White pine	33.4	57.8	41.0	.0	23.6
White pine/hemlock	34.3	100.0	.0	.0	31.8
Hemlock	14.3	57.8	.0	.0	13.8
Scotch pine	71.1	38.0	100.0	.0	31.8
White/red pine group	11.6	23.1	35.4	.0	9.8
White spruce	.0	100.0	.0	.0	100.0
Norway spruce	.0	70.7	.0	.0	70.7
Tamarack	.0	.0	70.7	.0	70.7
Spruce/fir group	.0	57.7	70.7	.0	44.7
Virginia pine	33.6	50.0	100.0	.0	26.0
Eastern redcedar	100.0	.0	100.0	.0	70.7
Pitch pine	70.8	71.0	.0	.0	48.8
Loblolly/shortleaf group	29.1	40.9	70.9	.0	21.9
Wh. pine/no.red oak/wh. ash	34.8	70.7	100.0	.0	29.8
Eastern redcedar/hardwood	.0	.0	70.7	.0	70.7
Virginia pine/oak	58.1	50.2	100.0	.0	35.5
Other oak/pine	70.7	40.8	.0	.0	35.4
Oak/pine group	27.5	28.9	50.0	.0	18.5
Post, black, or bear oak	29.0	.0	50.0	.0	25.1
Chestnut oak	13.7	12.0	34.6	.0	8.5
White oak/red oak/hickory	11.6	15.9	70.8	.0	9.3
White oak	23.3	18.1	100.0	.0	14.1
Northern red oak	13.9	26.3	71.1	.0	11.9
Y-poplar/wh. oak/no.red oak	34.5	100.0	.0	.0	32.6
Black locust	100.0	35.4	44.8	57.7	24.1
Black walnut	.0	47.1	.0	.0	47.1
Yellow-poplar	50.1	70.8	70.8	.0	35.4
Hawthorn/reverting field	.0	100.0	27.8	100.0	25.9
Scarlet oak	45.2	57.7	.0	.0	35.6
Sassafras/persimmon	.0	44.7	35.4	.0	27.8
Red maple/central hardwood	22.3	14.7	33.5	.0	11.5
Mixed central hardwoods	4.3	5.2	9.5	.0	2.8

Table 3 (SE).-continued

(Standard error as percentage of total)

Forest type	Stand-size class				All classes
	Saw-timber	Pole-timber	Sapling and seedling	Non-stocked	
Oak/hickory group	3.2	3.8	7.5	49.7	1.8
Black ash/Amer. elm/red maple	23.5	33.4	30.2	100.0	15.9
Red maple(lowland)	.0	58.2	71.0	.0	45.1
Red maple(upland)	23.2	23.6	33.4	57.7	14.4
River birch/sycamore	35.5	100.0	.0	.0	33.4
Cottonwood	.0	71.0	.0	.0	71.0
Willow	70.7	100.0	26.7	.0	24.4
Sycamore/pecan/American elm	57.8	.0	.0	.0	57.8
American elm/green ash	100.0	50.0	100.0	.0	40.9
Elm/ash/red maple group	13.8	16.3	16.6	50.0	8.6
Sugar maple/beech/yellow birch	4.9	9.1	20.5	71.1	3.9
Black cherry	14.6	12.8	11.6	100.0	7.2
Red maple/northern hardwoods	9.8	9.4	16.4	.0	6.1
Pin cherry/reverting field	100.0	44.8	18.0	70.7	15.8
Mixed northern hardwoods	8.3	8.9	11.2	100.0	5.2
Northern hardwoods group	3.4	4.5	6.0	41.0	2.1
Aspen	59.3	16.7	27.4	.0	13.8
Paper birch	.0	56.7	.0	.0	56.7
Gray birch	.0	.0	57.8	.0	57.8
Aspen/birch group	59.3	16.0	24.3	.0	13.0
All forest types	1.8	2.5	4.0	26.7	.7

Table 4.--Area of timberland by forest-type group and stocking class of all live trees, Pennsylvania, 1989

(In thousands of acres)

Forest-type group	Stocking class					All classes	SE
	Nonstocked	Poorly stocked	Moderately stocked	Fully stocked	Over-stocked		
White/red pine	.0	42.3	121.8	237.3	115.6	517.0	9.8
Spruce/fir	.0	5.5	11.1	11.3	.0	27.9	44.7
Loblolly/shortleaf	.0	11.1	22.0	66.7	5.2	104.9	21.9
Oak/pine	.0	11.3	46.8	94.0	5.5	157.6	18.5
Oak/hickory	21.9	295.0	1,912.9	4,799.6	546.2	7,575.6	1.8
Elm/ash/red maple	21.5	66.8	267.5	304.4	28.0	688.3	8.6
Northern hardwoods	31.7	232.2	1,628.4	4,194.0	698.8	6,785.1	2.1
Aspen/ birch	.0	5.3	106.6	167.9	35.3	315.1	13.0
Total	75.1	669.5	4,117.1	9,875.2	1,434.6	16,171.5	.7
SE	26.7	8.8	3.2	1.6	5.8	.7	

Table 4 (SE).--Area of timberland by forest-type group and stocking class of all live trees, Pennsylvania, 1989

(Standard error as percentage of total)

Forest-type group	Stocking class					All classes
	Nonstocked	Poorly stocked	Moderately stocked	Fully stocked	Over-stocked	
White/red pine	.0	35.4	21.4	14.7	20.9	9.8
Spruce/fir	.0	100.0	70.7	70.7	.0	44.7
Loblolly/shortleaf	.0	70.9	50.1	28.0	100.0	21.9
Oak/pine	.0	70.7	33.5	24.1	100.0	18.5
Oak/hickory	49.7	13.7	5.0	2.7	9.8	1.8
Elm/ash/red maple	50.0	29.1	14.2	13.3	44.7	8.6
Northern hardwoods	41.0	15.1	5.4	3.0	8.5	2.1
Aspen/ birch	.0	100.0	23.0	18.0	39.1	13.0
Total	26.7	8.8	3.2	1.6	5.8	.7

Table 5.--Number of live trees (1.0+ inches d.b.h.) on forest land by species and diameter class, Pennsylvania, 1989

(In thousands of trees)

Species	Diameter class (inches at breast height)						
	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9
White and red pine	74,262	33,192	23,677	17,101	11,106	7,046	4,061
Virginia pine	10,271	11,098	6,749	4,689	3,355	1,624	522
Other yellow pines	2,586	8,934	9,971	7,912	4,714	2,380	1,307
Eastern hemlock	117,255	74,071	47,584	32,960	19,532	13,553	8,461
Other softwoods	26,147	18,768	9,357	4,413	1,958	706	476
Total softwoods	230,521	146,063	97,338	67,075	40,666	25,309	14,828
Red maple	856,330	406,472	215,286	131,164	78,812	45,418	26,794
Sugar maple	258,039	118,257	64,897	53,549	34,770	20,702	13,149
Yellow birch	31,711	16,506	12,515	10,674	5,741	3,266	1,769
Sweet birch	251,103	86,507	52,286	39,840	23,233	10,937	4,881
Hickory	71,862	31,768	17,595	15,344	11,672	6,728	3,845
Beech	325,882	79,847	41,233	23,437	14,034	9,399	5,945
White ash	151,515	47,330	27,745	19,043	16,013	11,161	7,086
Black walnut	5,667	5,001	4,383	3,264	1,452	1,275	902
Yellow-poplar	31,410	12,312	8,353	5,891	5,139	4,935	4,229
Blackgum	148,599	56,143	19,511	6,412	2,605	1,321	555
Aspen	39,984	18,584	13,790	9,030	4,359	1,958	484
Black cherry	434,845	120,156	62,394	43,574	30,967	22,773	14,515
Chestnut oak	47,700	45,953	51,473	51,649	40,824	24,441	13,328
Northern red oak	97,295	37,979	31,898	31,207	26,924	23,365	16,218
Select white oaks	38,165	27,817	29,947	27,544	21,970	15,000	9,179
Other oaks	44,260	26,383	16,802	15,871	15,127	11,214	8,235
Black locust	38,728	14,443	12,288	8,491	5,550	2,541	1,581
Basswood	7,491	2,912	5,981	6,299	4,762	3,501	2,442
Other hardwoods	269,688	81,313	37,453	27,203	18,239	10,795	5,390
Other noncomm hardwoods	920,526	240,911	79,072	24,192	8,441	2,930	1,233
Total hardwoods	4,070,801	1,476,595	804,901	553,679	370,637	233,661	141,761
All species	4,301,322	1,622,657	902,239	620,755	411,303	258,970	156,589
SE	2.1	2.1	1.6	1.4	1.4	1.4	1.6

Table 5.-continued

(In thousands of trees)

Species	Diameter class (inches at breast height)							
	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	Total 5.0+	All classes	SE
White and red pine	2,084	1,498	1,056	1,396	156	69,183	176,637	9.4
Virginia pine	67	13	0	17	0	17,036	38,405	22.0
Other yellow pines	453	119	59	16	0	26,932	38,453	14.7
Eastern hemlock	4,496	2,584	1,301	1,755	102	132,329	323,654	6.8
Other softwoods	56	33	9	14	0	17,023	61,938	16.4
Total softwoods	7,157	4,248	2,426	3,198	258	262,503	639,087	4.9
Red maple	12,642	6,388	3,004	3,405	408	523,322	1,786,124	2.8
Sugar maple	6,593	3,377	1,653	1,939	341	200,971	577,267	4.2
Yellow birch	589	310	54	92	20	35,032	83,249	9.1
Sweet birch	1,875	765	317	243	16	134,392	472,002	5.5
Hickory	1,909	759	457	276	38	58,624	162,254	6.3
Beech	4,261	2,046	1,592	1,796	195	103,938	509,666	5.5
White ash	4,214	2,001	1,395	1,283	174	90,116	288,961	6.1
Black walnut	463	240	94	114	5	12,191	22,859	15.7
Yellow-poplar	3,211	2,171	1,436	1,339	198	36,901	80,623	12.3
Blackgum	357	165	86	110	12	31,135	235,878	8.3
Aspen	205	49	12	0	0	29,887	88,455	13.4
Black cherry	8,935	4,760	2,557	2,607	277	193,361	748,361	5.0
Chestnut oak	7,503	3,256	1,566	1,467	60	195,567	289,220	4.9
Northern red oak	11,163	7,404	4,238	5,307	770	158,493	293,768	4.5
Select white oaks	4,505	2,551	1,468	1,709	297	114,171	180,153	5.9
Other oaks	5,239	3,019	1,728	1,964	245	79,445	150,088	6.7
Black locust	847	322	203	224	5	32,053	85,224	10.4
Basswood	1,030	499	283	285	45	25,129	35,532	11.7
Other hardwoods	2,506	1,454	701	970	220	104,931	455,932	5.8
Other noncomm hardwoods	499	330	118	172	34	117,020	1,278,458	3.8
Total hardwoods	78,545	41,865	22,965	25,303	3,362	2,276,679	7,824,075	1.4
All species	85,702	46,113	25,391	28,501	3,619	2,539,182	8,463,162	1.4
SE	1.9	2.3	2.6	2.8	5.1	1.0	1.4	

Table 5 (SE).--Number of live trees (1.0+ inches d.b.h.) on forest land by species and diameter class, Pennsylvania, 1989

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)						
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9
White and red pine	13.8	15.9	14.2	14.8	13.2	12.0	13.1
Virginia pine	36.1	38.2	21.7	20.0	22.0	21.7	24.6
Other yellow pines	43.7	27.6	21.4	17.7	14.9	15.9	19.0
Eastern hemlock	11.5	9.8	7.2	6.4	6.6	7.4	7.4
Other softwoods	22.8	20.7	18.4	25.9	25.5	27.4	35.3
Total softwoods	8.0	7.5	6.0	5.7	5.6	5.6	6.1
Red maple	4.3	4.1	3.1	3.2	3.3	3.5	4.1
Sugar maple	6.2	6.8	5.1	5.0	5.2	5.3	5.6
Yellow birch	15.9	17.8	11.4	10.2	10.6	11.0	14.6
Sweet birch	8.0	9.4	6.5	6.2	6.0	6.7	8.2
Hickory	9.4	12.2	9.9	9.2	8.0	7.9	9.6
Beech	6.8	8.5	7.0	6.7	7.0	7.5	7.7
White ash	8.9	10.8	7.4	7.4	7.1	6.5	7.0
Black walnut	29.6	33.3	20.3	17.4	21.8	18.5	16.9
Yellow-poplar	24.9	23.4	13.0	15.1	11.4	10.4	9.7
Blackgum	10.7	9.9	9.3	10.4	14.7	14.7	19.5
Aspen	21.9	18.8	14.4	14.0	15.5	16.3	23.3
Black cherry	7.3	7.5	6.2	5.4	5.3	5.0	5.6
Chestnut oak	14.2	11.4	7.1	5.5	5.0	5.0	5.9
Northern red oak	9.8	10.9	7.0	6.2	5.7	5.1	5.2
Select white oaks	15.3	14.0	8.7	6.7	6.4	6.0	6.2
Other oaks	15.0	14.9	9.4	7.8	7.2	6.8	7.5
Black locust	17.7	18.1	14.9	12.5	12.2	14.1	15.7
Basswood	29.0	43.2	17.7	14.0	12.4	12.7	12.6
Other hardwoods	7.8	8.5	7.9	7.0	7.0	7.6	7.8
Other noncomm hardwoods	4.4	5.8	5.4	6.7	8.6	11.6	13.2
Total hardwoods	2.2	2.2	1.6	1.5	1.4	1.5	1.6
All species	2.1	2.1	1.6	1.4	1.4	1.4	1.6

Table 5 (SE).-continued

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)						
	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	Total 5.0+	All classes
White and red pine	12.7	13.0	13.1	11.7	21.8	10.4	9.4
Virginia pine	50.7	100.0	.0	74.4	.0	18.2	22.0
Other yellow pines	22.0	37.7	54.7	72.7	.0	14.1	14.7
Eastern hemlock	8.1	10.0	11.1	10.8	23.4	5.4	6.8
Other softwoods	50.5	58.5	100.0	70.8	.0	17.7	16.4
Total softwoods	6.6	7.7	8.6	7.8	16.2	4.5	4.9
Red maple	5.0	6.3	6.9	6.6	12.9	2.3	2.8
Sugar maple	7.4	8.1	9.8	10.4	16.3	3.9	4.2
Yellow birch	17.4	22.5	57.2	31.4	79.0	8.2	9.1
Sweet birch	10.3	15.8	23.6	20.9	70.8	4.9	5.5
Hickory	10.8	14.9	17.9	25.2	41.9	6.5	6.3
Beech	9.3	10.8	10.4	10.4	20.4	5.1	5.5
White ash	7.9	9.6	11.0	10.0	19.0	4.8	6.1
Black walnut	23.1	23.2	34.0	35.3	100.0	13.9	15.7
Yellow-poplar	10.4	11.4	11.8	11.4	29.3	7.9	12.3
Blackgum	24.2	29.7	35.7	30.1	71.6	7.6	8.3
Aspen	27.9	50.7	100.0	.0	.0	11.6	13.4
Black cherry	6.0	6.8	8.1	7.8	17.8	3.8	5.0
Chestnut oak	6.5	7.9	10.2	10.0	32.3	4.1	4.9
Northern red oak	5.4	5.5	6.5	6.1	9.5	3.7	4.5
Select white oaks	7.4	8.6	9.9	9.9	16.0	4.8	5.9
Other oaks	8.1	8.5	10.3	9.4	15.7	4.9	6.7
Black locust	16.1	26.2	33.2	26.6	100.0	9.9	10.4
Basswood	14.5	19.8	20.6	18.2	36.7	9.5	11.7
Other hardwoods	10.4	11.5	14.7	15.9	21.4	5.2	5.8
Other noncomm hardwoods	24.9	21.4	35.3	29.0	82.0	4.8	3.8
Total hardwoods	2.0	2.4	2.8	2.9	5.3	1.0	1.4
All species	1.9	2.3	2.6	2.8	5.1	1.0	1.4

Table 6.--Number of live trees (1.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 1989

(In thousands of trees)

Species	Diameter class (inches at breast height)						
	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9
White and red pine	73,291	32,879	23,505	16,887	11,012	6,973	4,007
Virginia pine	10,271	11,098	6,749	4,689	3,355	1,624	522
Other yellow pines	2,586	8,934	9,752	7,750	4,654	2,318	1,307
Eastern hemlock	116,256	72,105	46,951	32,491	19,313	13,376	8,439
Other softwoods	21,296	16,976	7,854	3,934	1,822	683	476
Total softwoods	223,700	141,993	94,811	65,750	40,156	24,974	14,751
Red maple	830,144	390,499	209,096	127,529	76,427	44,088	26,000
Sugar maple	249,792	116,225	63,345	52,082	33,909	20,239	12,760
Yellow birch	30,708	15,157	11,816	10,055	5,329	3,126	1,574
Sweet birch	244,957	83,869	49,811	37,574	22,133	10,478	4,779
Hickory	71,179	31,768	17,023	14,985	11,321	6,350	3,625
Beech	313,691	74,559	39,514	22,367	13,472	9,184	5,730
White ash	148,535	46,679	27,367	18,760	15,450	10,887	6,799
Black walnut	5,667	5,001	4,359	3,264	1,452	1,275	866
Yellow-poplar	31,410	12,312	8,224	5,803	5,020	4,753	4,066
Blackgum	146,596	54,707	19,126	6,388	2,543	1,235	555
Aspen	39,682	18,584	13,659	8,915	4,359	1,958	467
Black cherry	432,817	118,465	62,119	42,825	30,472	22,181	14,147
Chestnut oak	46,693	42,648	50,160	49,599	38,906	23,022	12,711
Northern red oak	95,608	37,293	30,903	30,254	26,230	22,394	15,184
Select white oaks	34,724	26,143	29,729	27,013	21,516	14,812	8,996
Other oaks	44,260	26,383	16,630	15,423	14,897	10,933	8,021
Black locust	38,728	14,096	12,263	8,313	5,484	2,462	1,581
Basswood	7,491	2,912	5,709	5,995	4,477	3,385	2,317
Other hardwoods	264,955	79,713	36,981	26,549	17,689	10,331	5,154
Other noncomm hardwoods	901,644	233,156	78,147	23,661	8,263	2,882	1,215
Total hardwoods	3,979,281	1,430,169	785,981	537,356	359,349	225,978	136,548
All species	4,202,981	1,572,161	880,793	603,107	399,505	250,953	151,300
SE	2.2	2.2	1.6	1.5	1.4	1.5	1.6

Table 6.-continued

(In thousands of trees)

Species	Diameter class (inches at breast height) 15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	Total 5.0+	All classes	SE
White and red pine	2,054	1,459	1,019	1,367	143	68,425	174,595	9.5
Virginia pine	67	13	0	17	0	17,036	38,405	22.0
Other yellow pines	453	119	59	16	0	26,430	37,951	14.9
Eastern hemlock	4,496	2,533	1,290	1,740	102	130,731	319,091	6.9
Other softwoods	56	33	9	14	0	14,881	53,154	16.8
Total softwoods	7,126	4,158	2,377	3,153	244	257,504	623,196	5.0
Red maple	12,246	6,308	2,934	3,346	404	508,376	1,729,019	2.8
Sugar maple	6,482	3,291	1,618	1,906	334	195,967	561,984	4.3
Yellow birch	556	310	54	92	20	32,933	78,798	9.2
Sweet birch	1,794	749	293	243	16	127,870	456,695	5.6
Hickory	1,811	679	442	268	38	56,542	159,490	6.4
Beech	4,198	2,003	1,578	1,737	188	99,972	488,222	5.7
White ash	4,102	1,885	1,317	1,194	166	87,927	283,141	6.2
Black walnut	463	240	94	105	5	12,122	22,790	15.8
Yellow-poplar	3,008	2,082	1,330	1,253	189	35,728	79,449	12.5
Blackgum	329	141	86	99	12	30,516	231,820	8.4
Aspen	205	49	12	0	0	29,625	87,890	13.5
Black cherry	8,686	4,538	2,519	2,480	259	190,227	741,509	5.1
Chestnut oak	7,157	3,161	1,508	1,383	60	187,669	277,011	5.1
Northern red oak	10,777	7,040	4,041	5,037	734	152,596	285,497	4.6
Select white oaks	4,345	2,504	1,412	1,660	287	112,274	173,141	5.7
Other oaks	5,060	2,924	1,635	1,929	245	77,697	148,341	6.8
Black locust	819	322	192	224	5	31,665	84,489	10.4
Basswood	969	459	270	265	39	23,885	34,289	12.1
Other hardwoods	2,321	1,386	701	944	220	102,277	446,945	5.9
Other noncomm hardwoods	499	330	118	172	30	115,317	1,250,117	3.9
Total hardwoods	75,828	40,401	22,155	24,338	3,251	2,211,187	7,620,637	1.5
All species	82,954	44,559	24,533	27,491	3,495	2,468,690	8,243,833	1.4
SE	2.0	2.4	2.7	2.9	5.2	1.0	1.4	

Table 6 (SE).--Number of live trees (1.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 1989

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)						
	1.0- 2.9	3.0- 4.9	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9
White and red pine	14.0	16.1	14.3	14.9	13.3	12.1	13.2
Virginia pine	36.1	38.2	21.7	20.0	22.0	21.7	24.6
Other yellow pines	43.7	27.6	21.9	18.0	15.1	16.3	19.0
Eastern hemlock	11.5	10.0	7.2	6.5	6.7	7.4	7.4
Other softwoods	24.0	21.1	18.8	28.0	27.0	28.2	35.3
Total softwoods	8.1	7.6	6.1	5.8	5.7	5.7	6.1
Red maple	4.4	4.2	3.2	3.2	3.4	3.6	4.2
Sugar maple	6.3	6.9	5.2	5.1	5.3	5.4	5.7
Yellow birch	16.3	18.1	11.8	10.5	10.9	11.3	15.4
Sweet birch	8.1	9.6	6.6	6.4	6.2	6.9	8.4
Hickory	9.5	12.2	10.1	9.4	8.2	8.1	9.9
Beech	7.0	8.8	7.2	6.8	7.1	7.6	7.8
White ash	8.9	10.9	7.5	7.4	7.3	6.6	7.1
Black walnut	29.6	33.3	20.4	17.4	21.8	18.5	17.3
Yellow-poplar	24.9	23.4	13.1	15.3	11.7	10.4	9.8
Blackgum	10.9	9.9	9.5	10.4	15.0	15.4	19.5
Aspen	22.1	18.8	14.5	14.2	15.5	16.3	23.9
Black cherry	7.4	7.6	6.3	5.5	5.4	5.1	5.7
Chestnut oak	14.5	11.6	7.3	5.6	5.1	5.1	6.0
Northern red oak	9.9	11.1	7.2	6.3	5.8	5.2	5.3
Select white oaks	14.2	14.5	8.7	6.9	6.5	6.1	6.3
Other oaks	15.0	14.9	9.5	8.0	7.3	6.9	7.6
Black locust	17.7	18.4	14.9	12.7	12.3	14.5	15.7
Basswood	29.0	43.2	18.4	14.5	12.8	13.1	13.1
Other hardwoods	7.9	8.6	7.9	7.2	7.1	7.8	7.9
Other noncomm hardwoods	4.4	5.9	5.5	6.7	8.7	11.7	13.3
Total hardwoods	2.2	2.3	1.7	1.5	1.5	1.5	1.7
All species	2.2	2.2	1.6	1.5	1.4	1.5	1.6

Table 6 (SE).-continued

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)						
	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	Total 5.0+	All classes
White and red pine	12.9	13.1	13.5	11.8	22.9	10.5	9.5
Virginia pine	50.7	100.0	.0	74.4	.0	18.2	22.0
Other yellow pines	22.0	37.7	54.7	72.7	.0	14.4	14.9
Eastern hemlock	8.1	10.2	11.2	10.9	23.4	5.4	6.9
Other softwoods	50.5	58.5	100.0	70.8	.0	18.6	16.8
Total softwoods	6.6	7.8	8.7	7.9	16.6	4.5	5.0
Red maple	5.1	6.3	7.0	6.7	13.0	2.4	2.8
Sugar maple	7.5	8.3	9.9	10.6	16.5	4.0	4.3
Yellow birch	18.0	22.5	57.2	31.4	79.0	8.4	9.2
Sweet birch	10.5	16.0	25.1	20.9	70.8	5.0	5.6
Hickory	11.1	15.2	18.2	25.8	41.9	6.7	6.4
Beech	9.4	11.0	10.5	10.6	20.9	5.2	5.7
White ash	7.9	9.8	11.1	10.3	19.8	4.8	6.2
Black walnut	23.1	23.2	34.0	37.3	100.0	14.0	15.8
Yellow-poplar	10.4	11.5	11.9	11.8	30.5	8.1	12.5
Blackgum	24.9	30.3	35.7	31.6	71.6	7.8	8.4
Aspen	27.9	50.7	100.0	.0	.0	11.8	13.5
Black cherry	6.0	6.9	8.2	7.8	18.2	3.9	5.1
Chestnut oak	6.7	8.0	10.3	10.4	32.3	4.3	5.1
Northern red oak	5.5	5.7	6.7	6.3	9.7	3.8	4.6
Select white oaks,	7.6	8.7	10.1	10.1	16.3	4.9	5.7
Other oaks	8.3	8.6	10.6	9.5	15.7	5.0	6.8
Black locust	16.5	26.2	34.6	26.6	100.0	10.0	10.4
Basswood	14.9	20.4	21.0	18.8	39.3	9.9	12.1
Other hardwoods	10.7	11.9	14.7	16.1	21.4	5.3	5.9
Other noncomm hardwoods	24.9	21.4	35.3	29.0	90.7	4.9	3.9
Total hardwoods	2.1	2.5	2.8	3.0	5.4	1.1	1.5
All species	2.0	2.4	2.7	2.9	5.2	1.0	1.4

Table 7.--Number of trees (5.0+ inches d.b.h.) on timberland by species and tree class, Pennsylvania, 1989

(In thousands of trees)

Species	Tree class								All classes	SE
	Preferred	Acceptable	All growing stock	Rough cull	Rotten cull	All live	Salvable dead	Nonsalvable dead		
White and red pine	1,254	65,026	66,280	1,827	317	68,425	1,764	7,267	77,455	10.1
Virginia pine	0	16,511	16,511	526	0	17,036	590	1,930	19,556	17.7
Other yellow pines	66	25,483	25,549	764	117	26,430	1,244	5,895	33,570	14.0
Eastern hemlock	2,794	123,476	126,270	3,702	758	130,731	2,615	4,068	137,415	5.4
Other softwoods	255	13,869	14,123	731	28	14,881	440	258	15,579	18.7
Total softwoods	4,368	244,365	248,733	7,550	1,220	257,504	6,653	19,419	283,576	4.5
Red maple	734	486,614	487,348	12,637	8,391	508,376	6,591	21,891	536,858	2.4
Sugar maple	548	188,739	189,288	3,911	2,767	195,967	2,853	7,921	206,740	4.0
Yellow birch	5	31,385	31,390	964	579	32,933	1,197	5,246	39,376	7.9
Sweet birch	64	124,344	124,408	2,273	1,189	127,870	3,118	9,733	140,721	4.9
Hickory	261	55,246	55,507	545	491	56,542	1,801	2,159	60,502	6.5
Beech	95	94,638	94,733	1,969	3,271	99,972	1,425	5,240	106,638	5.2
White ash	1,311	82,734	84,045	2,421	1,461	87,927	3,485	2,805	94,218	4.8
Black walnut	49	11,453	11,502	384	235	12,122	316	311	12,749	13.7
Yellow-poplar	1,786	33,104	34,890	180	657	35,728	319	445	36,491	8.0
Blackgum	22	28,729	28,751	1,035	730	30,516	0	561	31,076	7.7
Aspen	0	29,156	29,156	339	130	29,625	1,576	5,121	36,322	11.1
Black cherry	1,996	177,145	179,141	8,666	2,421	190,227	3,759	14,495	208,482	3.8
Chestnut oak	177	181,875	182,051	4,041	1,577	187,669	6,483	45,611	239,763	4.0
Northern red oak	3,671	146,267	149,938	1,687	971	152,596	4,047	18,018	174,661	3.7
Select white oaks	907	109,192	110,099	1,366	809	112,274	4,586	18,932	135,793	4.7
Other oaks	1,248	74,572	75,820	869	1,008	77,697	3,613	13,362	94,672	5.0
Black locust	0	25,399	25,399	3,249	3,017	31,665	2,289	13,400	47,353	8.9
Basswood	398	22,705	23,103	487	295	23,885	582	1,369	25,836	9.7
Other hardwoods	296	97,308	97,605	3,429	1,244	102,277	4,570	15,319	122,167	5.0
Other noncomm hardwoods	0	0	0	107,543	7,774	115,317	5,523	22,572	143,412	4.5
Total hardwoods	13,568	2,000,606	2,014,174	157,994	39,018	2,211,187	58,133	224,511	2,493,831	1.0
All species	17,937	2,244,971	2,262,907	165,545	40,238	2,468,690	64,787	243,930	2,777,407	1.0
SE	5.2	1.1	1.1	3.4	5.4	1.0	3.8	2.5	1.0	

Table 7 (SE).--Number of trees (5.0+ inches d.b.h.) on timberland by species and tree class, Pennsylvania, 1989

(Standard error as percentage of total)

Species	Tree class								All classes
	Preferred	Acceptable	All growing stock	Rough cull	Rotten cull	All live	Salvable dead	Nonsalvable dead	
White and red pine	18.4	10.9	10.7	19.3	33.6	10.5	22.6	15.4	10.1
Virginia pine	.0	18.1	18.1	50.8	.0	18.2	42.7	27.5	17.7
Other yellow pines	48.6	14.6	14.5	33.2	47.0	14.4	35.5	20.6	14.0
Eastern hemlock	15.3	5.5	5.5	15.3	20.2	5.4	15.4	14.5	5.4
Other softwoods	52.6	19.0	19.1	41.0	100.0	18.6	44.5	55.0	18.7
Total softwoods	12.1	4.6	4.6	10.9	16.1	4.5	11.8	9.4	4.5
Red maple	20.0	2.4	2.4	7.5	9.1	2.4	10.8	6.8	2.4
Sugar maple	24.7	4.0	4.0	12.1	15.0	4.0	15.5	10.4	4.0
Yellow birch	100.0	8.5	8.5	20.8	25.4	8.4	21.3	11.0	7.9
Sweet birch	50.2	5.1	5.1	17.0	20.1	5.0	15.8	10.2	4.9
Hickory	35.4	6.7	6.7	34.3	29.9	6.7	18.8	13.9	6.5
Beech	53.9	5.3	5.3	15.5	12.8	5.2	23.9	12.2	5.2
White ash	14.1	4.9	4.9	16.0	20.8	4.8	17.6	15.4	4.8
Black walnut	60.3	14.3	14.3	37.0	45.3	14.0	60.3	42.8	13.7
Yellow-poplar	13.9	8.3	8.0	56.6	36.0	8.1	36.7	29.9	8.0
Blackgum	100.0	8.1	8.1	32.2	34.2	7.8	.0	41.0	7.7
Aspen	.0	11.8	11.8	42.6	47.9	11.8	24.4	14.5	11.1
Black cherry	10.9	4.0	4.0	10.6	13.1	3.9	14.0	8.4	3.8
Chestnut oak	29.5	4.3	4.3	12.1	15.7	4.3	13.2	6.8	4.0
Northern red oak	10.1	3.9	3.8	17.0	20.1	3.8	12.4	8.5	3.7
Select white oaks	17.1	5.0	4.9	19.2	25.5	4.9	14.0	8.3	4.7
Other oaks	16.0	5.0	5.0	33.3	23.8	5.0	15.8	9.7	5.0
Black locust	.0	10.5	10.5	26.0	16.9	10.0	18.3	11.8	8.9
Basswood	32.4	10.1	10.1	37.0	28.6	9.9	30.4	21.5	9.7
Other hardwoods	26.8	5.5	5.4	16.5	19.4	5.3	14.0	8.5	5.0
Other noncomm hardwoods	.0	.0	.0	4.7	20.0	4.9	13.2	7.4	4.5
Total hardwoods	5.3	1.1	1.1	3.6	5.5	1.1	4.1	2.7	1.0
All species	5.2	1.1	1.1	3.4	5.4	1.0	3.8	2.5	1.0

Table 8.--Number of growing-stock trees (5.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 1989

(In thousands of trees)

Species	Diameter class (inches at breast height)											
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	All classes	SE
White and red pine	22,807	16,685	10,325	6,807	3,957	1,961	1,348	973	1,293	123	66,280	10.7
Virginia pine	6,368	4,689	3,290	1,577	489	67	13	0	17	0	16,511	18.1
Other yellow pines	9,468	7,712	4,267	2,206	1,248	453	119	59	16	0	25,549	14.5
Eastern hemlock	45,747	31,978	17,611	12,816	8,313	4,349	2,519	1,215	1,637	84	126,270	5.5
Other softwoods	7,439	3,827	1,631	655	476	56	21	9	7	0	14,123	19.1
Total softwoods	91,830	64,891	37,124	24,062	14,484	6,886	4,021	2,257	2,970	208	248,733	4.6
Red maple	200,776	123,543	74,914	40,747	24,306	11,502	5,728	2,693	2,862	277	487,348	2.4
Sugar maple	61,017	50,985	33,040	19,547	12,092	6,170	3,103	1,472	1,640	222	189,288	4.0
Yellow birch	11,543	9,660	5,193	2,735	1,396	520	252	31	55	5	31,390	8.5
Sweet birch	48,576	37,202	21,791	9,618	4,409	1,657	668	245	225	16	124,408	5.1
Hickory	16,729	14,862	11,057	6,220	3,513	1,731	679	429	253	33	55,507	6.7
Beech	38,376	21,336	13,013	8,405	5,233	3,819	1,815	1,315	1,325	95	94,733	5.3
White ash	25,886	18,169	14,901	10,434	6,538	3,865	1,811	1,242	1,070	128	84,045	4.9
Black walnut	4,232	3,086	1,416	1,107	831	430	229	94	73	5	11,502	14.3
Yellow-poplar	7,833	5,559	4,958	4,707	4,066	2,958	2,067	1,317	1,247	177	34,890	8.0
Blackgum	18,059	6,067	2,380	1,141	534	298	101	76	90	5	28,751	8.1
Aspen	13,371	8,853	4,303	1,928	434	205	49	12	0	0	29,156	11.8
Black cherry	57,881	40,057	29,434	20,715	13,505	8,286	4,380	2,377	2,293	213	179,141	4.0
Chestnut oak	48,836	48,491	38,484	21,876	12,083	6,741	2,944	1,389	1,163	44	182,051	4.3
Northern red oak	30,107	29,709	26,138	21,858	14,990	10,623	6,920	4,019	4,877	696	149,938	3.8
Select white oaks	28,877	26,512	21,421	14,472	8,955	4,243	2,477	1,359	1,557	226	110,099	4.9
Other oaks	16,023	14,944	14,665	10,699	7,908	5,016	2,882	1,613	1,859	210	75,820	5.0
Black locust	9,941	6,807	4,550	1,817	1,180	592	241	118	151	0	25,399	10.5
Basswood	5,450	5,876	4,355	3,318	2,222	969	433	238	214	28	23,103	10.1
Other hardwoods	34,318	25,902	17,392	9,883	4,967	2,171	1,319	639	827	185	97,605	5.4
Total hardwoods	677,832	497,621	343,404	211,229	129,164	71,797	38,100	20,681	21,782	2,564	2,014,174	1.1
All species	769,662	562,512	380,528	235,291	143,648	78,683	42,121	22,938	24,752	2,772	2,262,907	1.1
SE	1.7	1.5	1.5	1.5	1.7	2.0	2.4	2.8	3.0	5.7	1.1	

Table 8 (SE).--Number of growing-stock trees (5.0+ inches d.b.h.) on timberland by species and diameter class, Pennsylvania, 1989

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)										All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	
White and red pine	14.6	15.1	13.9	12.4	13.3	13.4	13.1	13.6	12.1	24.2	10.7
Virginia pine	21.5	20.0	22.2	22.1	25.5	50.7	100.0	.0	74.4	.0	18.1
Other yellow pines	22.2	18.1	15.0	16.5	19.7	22.0	37.7	54.7	72.7	.0	14.5
Eastern hemlock	7.2	6.5	6.9	7.6	7.5	8.3	10.2	11.6	11.2	25.4	5.5
Other softwoods	19.2	28.7	27.2	28.5	35.3	50.5	71.9	100.0	100.0	.0	19.1
Total softwoods	6.1	5.9	5.9	5.8	6.2	6.7	7.9	8.9	8.1	17.8	4.6
Red maple	3.2	3.3	3.4	3.7	4.3	5.2	6.6	7.3	7.2	14.5	2.4
Sugar maple	5.2	5.1	5.4	5.4	5.8	7.7	8.6	10.2	11.3	18.2	4.0
Yellow birch	11.8	10.5	10.8	11.8	16.1	18.7	25.7	59.1	42.7	100.0	8.5
Sweet birch	6.7	6.4	6.2	7.1	8.7	11.0	17.2	26.8	21.8	70.8	5.1
Hickory	10.2	9.4	8.3	8.1	10.1	11.4	15.2	18.5	26.1	45.9	6.7
Beech	7.3	6.9	7.2	7.9	8.2	9.7	10.9	11.5	11.8	27.0	5.3
White ash	7.6	7.5	7.4	6.7	7.3	8.2	10.1	11.4	10.8	21.7	4.9
Black walnut	20.9	18.0	21.9	19.1	17.6	22.9	23.8	34.0	38.0	100.0	14.3
Yellow-poplar	13.3	15.7	11.8	10.4	9.8	10.4	11.6	12.0	11.9	32.2	8.0
Blackgum	9.9	10.8	15.7	16.0	19.2	26.5	35.5	38.2	29.9	100.0	8.1
Aspen	14.7	14.2	15.6	16.5	25.1	27.9	50.7	100.0	.0	.0	11.8
Black cherry	6.5	5.7	5.4	5.3	5.9	6.2	7.0	8.4	8.2	20.5	4.0
Chestnut oak	7.4	5.7	5.2	5.2	6.2	6.9	8.2	10.6	10.8	38.6	4.3
Northern red oak	7.4	6.3	5.8	5.3	5.3	5.5	5.7	6.7	6.4	9.9	3.8
Select white oaks	8.9	6.9	6.5	6.1	6.4	7.6	8.7	10.3	10.1	17.4	4.9
Other oaks	9.6	8.1	7.3	7.0	7.7	8.3	8.7	10.6	9.7	16.8	5.0
Black locust	15.6	13.3	13.2	16.9	16.4	19.7	30.3	41.6	30.8	.0	10.5
Basswood	19.1	14.7	13.0	13.1	13.2	14.9	20.8	22.5	21.0	47.0	10.1
Other hardwoods	8.3	7.3	7.2	7.8	8.1	11.2	12.1	15.2	16.0	22.5	5.4
Total hardwoods	1.8	1.6	1.5	1.6	1.8	2.1	2.6	2.9	3.1	6.0	1.1
All species	1.7	1.5	1.5	1.5	1.7	2.0	2.4	2.8	3.0	5.7	1.1

Table 9.--Net volume of all trees (5.0+ inches d.b.h.) on timberland by class of timber and species group, Pennsylvania, 1989
(In millions of cubic feet)

Class of timber	Species group				All species	SE
	Pines	Other softwoods	Soft hardwoods	Hard hardwoods		
Growing-stock trees:						
Sawtimber size:						
Poletimber size	276.6	334.8	4,328.7	4,623.3	9,563.4	1.2
Total growing-stock trees	276.6	334.8	4,328.7	4,623.3	9,563.4	1.2
Rough trees:						
Sawtimber size	27.8	31.9	238.4	194.8	492.9	4.1
Poletimber size	2.2	3.3	217.3	186.0	408.7	4.2
Total rough trees	30.0	35.2	455.7	380.8	901.7	3.1
Rotten trees:						
Sawtimber size	1.6	4.1	57.2	83.5	146.4	4.8
Poletimber size	.1	.1	10.3	9.2	19.7	6.4
Total rotten trees	1.7	4.2	67.5	92.7	166.1	4.3
Salvable dead[a] trees:						
All classes	308.3	374.2	4,851.9	5,096.8	10,631.2	1.2
SE	9.7	5.9	1.9	1.7	1.2	

[a] Includes noncommercial species.

Table 9 (SE).--Net volume of all trees (5.0+ inches d.b.h.) on timberland by class of timber and species group, Pennsylvania, 1989
(Standard error as percentage of total)

Class of timber	Species group				All species
	Pines	Other softwoods	Soft hardwoods	Hard hardwoods	
Growing-stock trees:					
Sawtimber size:					
Poletimber size	10.4	6.1	2.0	1.8	1.2
Total growing-stock trees	10.4	6.1	2.0	1.8	1.2
Rough trees:					
Sawtimber size	20.9	15.1	6.0	5.4	4.1
Poletimber size	26.8	22.6	6.2	5.5	4.2
Total rough trees	19.5	14.4	4.7	4.1	3.1
Rotten trees:					
Sawtimber size	26.8	21.0	6.8	6.6	4.8
Poletimber size	71.8	71.8	9.0	8.5	6.4
Total rotten trees	25.7	20.5	6.0	6.0	4.3
Salvable dead[a] trees:					
All classes	9.7	5.9	1.9	1.7	1.2

[a] Includes noncommercial species.

Table 10.--Sound volume of all live trees (5.0+ inches d.b.h.) on forest land by species and diameter class, Pennsylvania, 1989
(In millions of cubic feet)

Species	Diameter class (inches at breast height)										All classes	SE
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+		
White and red pine	68.6	98.8	125.1	118.1	101.3	63.5	56.4	57.1	107.0	19.0	814.7	8.3
Virginia pine	15.7	28.1	33.3	23.2	9.5	2.0	.5	.0	1.0	.0	113.4	18.0
Other yellow pines	23.0	45.6	42.3	32.8	24.1	13.7	4.4	2.7	1.2	.0	189.7	11.9
Eastern hemlock	115.0	181.6	177.8	194.1	187.1	131.7	97.9	62.1	123.1	11.3	1,281.7	5.4
Other softwoods	23.9	25.0	17.6	10.7	9.6	1.6	.8	.4	.5	.0	90.3	19.2
Total softwoods	246.2	379.1	396.1	378.9	331.6	212.5	160.0	122.3	232.9	30.3	2,489.8	4.2
Red maple	514.3	830.3	916.6	809.0	696.0	424.9	280.2	166.7	228.9	50.6	4,917.5	2.5
Sugar maple	176.2	386.4	448.0	417.1	355.0	230.7	158.7	96.5	141.8	33.8	2,444.2	4.0
Yellow birch	31.8	64.7	65.0	51.2	39.7	19.0	11.3	1.7	4.5	.7	289.6	8.1
Sweet birch	138.0	257.1	267.4	179.9	115.2	60.3	31.5	14.6	18.1	1.9	1,084.0	4.6
Hickory	38.0	107.6	148.2	133.5	107.5	70.4	37.0	27.9	17.3	4.8	692.3	6.0
Beech	99.2	154.0	183.2	168.7	150.0	146.0	93.7	85.6	123.7	18.6	1,222.8	5.1
White ash	70.7	126.8	192.3	220.9	197.8	154.3	99.5	82.3	102.0	19.8	1,266.4	4.7
Black walnut	9.6	16.6	14.5	17.9	21.6	14.1	9.4	5.0	6.1	.8	115.6	11.9
Yellow-poplar	20.9	38.0	71.8	104.0	133.8	136.2	121.9	105.9	137.8	35.7	906.0	7.3
Blackgum	43.4	37.1	26.2	20.9	12.9	10.6	5.4	4.0	7.2	.5	168.1	7.1
Aspen	39.2	61.3	54.3	39.2	13.3	8.0	2.5	.7	.0	.0	218.6	11.0
Black cherry	149.5	278.6	383.2	437.8	424.2	351.9	247.1	171.2	219.9	43.1	2,706.4	3.7
Chestnut oak	118.3	271.3	390.0	355.4	274.2	204.0	115.4	69.4	72.1	5.4	1,875.5	3.8
Northern red oak	77.9	185.8	291.1	394.7	398.8	360.9	317.7	229.9	388.9	99.0	2,744.7	3.4
Select white oaks	67.2	151.0	222.9	241.8	224.8	147.7	103.8	74.1	127.3	40.7	1,401.3	4.1
Other oaks	39.2	92.3	160.4	190.1	201.4	169.5	130.5	92.1	146.3	29.4	1,251.2	4.7
Black locust	22.2	36.9	45.8	28.5	27.9	19.6	9.8	6.4	11.1	.0	208.2	10.3
Basswood	13.0	46.7	61.2	75.6	76.8	43.3	23.5	14.0	16.0	5.2	375.3	8.7
Other hardwoods	87.5	170.3	209.2	195.1	140.6	81.7	60.7	34.3	69.7	34.3	1,083.5	5.2
Total hardwoods	1,756.2	3,312.7	4,151.3	4,081.3	3,611.6	2,653.2	1,859.8	1,282.3	1,838.7	424.2	24,971.3	1.0
All species	2,002.4	3,691.8	4,547.4	4,460.2	3,943.2	2,865.7	2,019.7	1,404.7	2,071.6	454.5	27,461.1	1.0
SE	1.7	1.5	1.4	1.4	1.6	2.0	2.4	2.8	2.9	5.8	1.0	

Table 10 (SE).--Sound volume of all live trees (5.0+ inches d.b.h.) on forest land by species and diameter class, Pennsylvania, 1989

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)										
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	All classes
White and red pine	14.9	15.2	14.0	12.2	13.2	13.4	12.9	13.3	11.8	23.7	8.3
Virginia pine	21.5	19.6	22.3	22.0	25.5	50.9	100.0	.0	73.1	.0	18.0
Other yellow pines	21.3	17.9	14.9	16.2	19.5	22.0	38.0	55.1	72.4	.0	11.9
Eastern hemlock	7.2	6.4	6.8	7.6	7.5	8.4	10.1	11.6	11.1	25.9	5.4
Other softwoods	18.9	28.9	25.4	28.6	35.3	50.8	74.7	100.0	100.0	.0	19.2
Total softwoods	6.3	5.9	6.1	5.9	6.3	6.8	7.8	8.9	8.0	17.8	4.2
Red maple	3.1	3.2	3.3	3.6	4.2	5.2	6.5	7.3	7.0	14.5	2.5
Sugar maple	5.1	5.0	5.2	5.3	5.7	7.6	8.4	10.0	11.1	18.5	4.0
Yellow birch	11.4	10.2	10.5	11.4	15.4	18.2	25.7	59.1	43.0	100.0	8.1
Sweet birch	6.5	6.2	5.9	6.9	8.5	10.7	16.8	26.0	22.3	70.8	4.6
Hickory	9.8	9.2	8.2	7.9	9.7	11.1	15.1	18.0	25.0	45.4	6.0
Beech	7.1	6.8	7.1	7.8	8.1	9.4	10.7	11.5	11.6	26.0	5.1
White ash	7.4	7.4	7.2	6.6	7.2	8.1	9.9	11.4	10.6	21.3	4.7
Black walnut	21.4	18.3	21.8	19.0	17.1	23.1	23.8	34.2	34.8	100.0	11.9
Yellow-poplar	12.9	15.6	11.6	10.5	9.7	10.5	11.4	11.8	11.2	32.9	7.3
Blackgum	9.4	10.7	15.1	15.6	19.2	26.0	34.5	38.1	28.2	100.0	7.1
Aspen	14.5	14.1	15.5	16.4	24.8	27.8	51.3	100.0	.0	.0	11.0
Black cherry	6.4	5.6	5.4	5.2	5.8	6.1	6.9	8.4	8.1	20.1	3.7
Chestnut oak	7.1	5.5	5.0	5.1	6.0	6.7	8.0	10.4	10.3	38.4	3.8
Northern red oak	7.0	6.2	5.7	5.1	5.2	5.4	5.5	6.6	6.2	9.7	3.4
Select white oaks	8.9	6.8	6.4	6.1	6.2	7.4	8.6	10.0	10.0	16.9	4.1
Other oaks	9.4	7.9	7.2	6.9	7.5	8.1	8.5	10.5	9.8	16.7	4.7
Black locust	15.4	13.1	13.2	17.0	16.3	19.5	30.0	39.2	30.6	.0	10.3
Basswood	17.8	14.2	12.6	12.7	12.7	14.4	20.0	21.9	20.1	42.2	8.7
Other hardwoods	8.6	7.4	7.2	7.9	8.1	10.9	11.7	15.3	16.4	23.0	5.2
Total hardwoods	1.7	1.6	1.5	1.5	1.7	2.1	2.5	2.9	3.1	6.1	1.0
All species	1.7	1.5	1.4	1.4	1.6	2.0	2.4	2.8	2.9	5.8	1.0

Table 11.--Net volume of growing-stock trees on timberland by species and forest-type group, Pennsylvania, 1989

(In millions of cubic feet)

Species	Forest-type group									Total	SE
	White/ red pine	Spruce/ fir	Loblolly/ shortleaf	Oak/ pine	Oak/ hickory	Oak/gum/ cypress	Elm/ash/ red maple	Northern hardwoods	Aspen/ birch		
White and red pine	298.2	2.8	16.1	66.2	237.4	.0	2.1	163.4	15.1	801.2	8.4
Virginia pine	.0	.0	66.6	17.2	21.5	.0	.8	7.4	.0	113.4	18.0
Other yellow pines	45.7	.4	28.0	32.9	61.5	.0	.5	15.8	2.3	187.2	12.1
Eastern hemlock	392.4	.0	.0	4.2	158.0	.0	7.3	699.6	6.9	1,268.4	5.4
Other softwoods	4.5	21.8	2.2	2.5	15.9	.0	1.8	26.1	7.7	82.5	20.3
Total softwoods	740.8	24.9	112.8	123.0	494.3	.0	12.5	912.3	32.1	2,452.7	4.2
Red maple	105.2	.3	8.9	24.2	1,804.4	.0	451.7	2,346.7	39.3	4,780.8	2.5
Sugar maple	9.7	.0	.1	1.6	172.2	.0	17.0	2,174.7	7.8	2,383.1	4.1
Yellow birch	21.7	.0	.0	.2	9.4	.0	1.8	236.8	1.2	271.0	8.2
Sweet birch	30.8	.0	.9	6.2	315.1	.0	4.4	671.3	7.1	1,035.8	4.8
Hickory	6.8	.0	.0	2.6	500.1	.0	16.0	135.3	1.0	661.8	6.1
Beech	30.4	.0	.0	.0	167.1	.0	15.6	970.0	2.4	1,185.5	5.2
White ash	15.5	1.5	5.4	10.8	319.6	.0	56.9	805.2	4.1	1,219.0	4.7
Black walnut	1.6	.0	1.2	.5	71.0	.0	8.9	30.7	.0	113.8	12.0
Yellow-poplar	18.2	.0	4.5	.9	579.4	.0	11.7	249.0	.0	863.7	7.4
Blackgum	1.1	1.0	.2	.6	123.5	.0	1.1	35.4	.0	162.8	7.2
Aspen	4.7	.0	.0	.8	30.9	.0	15.5	96.1	69.2	217.3	11.1
Black cherry	37.4	3.0	1.7	6.3	549.4	.0	59.4	1,960.5	18.1	2,635.8	3.7
Chestnut oak	13.3	.0	3.2	14.5	1,661.7	.0	1.1	89.4	5.0	1,788.0	3.9
Northern red oak	24.6	.0	1.8	16.2	2,133.0	.0	13.7	411.0	19.3	2,619.5	3.5
Select white oaks	30.6	.0	1.2	12.8	1,180.4	.0	20.5	120.1	4.8	1,370.4	4.2
Other oaks	7.8	.0	3.8	11.0	1,109.1	.0	14.5	71.4	.6	1,218.1	4.8
Black locust	.3	.0	.0	2.2	148.6	.0	3.1	51.5	.3	205.9	10.4
Basswood	2.9	.0	.0	.4	32.8	.0	1.4	315.2	2.2	354.9	9.0
Other hardwoods	23.7	1.0	2.3	8.3	295.4	.0	180.0	396.2	141.8	1,048.6	5.3
Total hardwoods	386.2	6.7	35.2	120.1	11,203.1	.0	894.3	11,166.2	324.2	24,136.0	1.1
All species	1,127.0	31.6	148.0	243.1	11,697.4	.0	906.8	12,078.5	356.3	26,588.8	1.0
SE	10.7	54.0	24.6	21.4	2.3	.0	11.1	2.4	16.1	1.0	

Table 11 (SE).--Net volume of growing-stock trees on timberland by species and forest-type group, Pennsylvania, 1989

(Standard error as percentage of total)

Species	Forest-type group									Total
	White/ red pine	Spruce/ fir	Loblolly/ shortleaf	Oak/ pine	Oak/ hickory	Oak/gum/ cypress	Elm/ash/ red maple	Northern hardwoods	Aspen/ birch	
White and red pine	19.2	84.5	40.3	31.6	9.5	.0	63.3	12.2	39.0	8.4
Virginia pine	.0	.0	28.3	39.2	18.4	.0	91.1	48.2	.0	18.0
Other yellow pines	32.9	100.0	36.1	31.9	12.8	.0	100.0	38.4	73.5	12.1
Eastern hemlock	13.4	.0	.0	57.7	11.6	.0	36.9	6.6	49.4	5.4
Other softwoods	53.1	59.8	71.0	71.4	30.7	.0	63.2	29.5	52.9	20.3
Total softwoods	11.2	55.3	24.8	22.0	6.7	.0	26.8	5.8	28.6	4.2
Red maple	16.6	78.8	53.9	31.9	4.0	.0	15.8	4.0	22.2	2.5
Sugar maple	30.8	.0	100.0	58.3	10.2	.0	38.2	4.5	36.2	4.1
Yellow birch	28.2	.0	.0	100.0	26.2	.0	58.5	9.1	63.8	8.2
Sweet birch	25.5	.0	100.0	53.4	6.8	.0	40.5	6.7	33.5	4.8
Hickory	46.6	.0	.0	51.9	7.6	.0	26.8	10.9	95.5	6.1
Beech	27.2	.0	.0	.0	12.7	.0	28.0	6.0	52.3	5.2
White ash	31.0	76.9	58.1	34.4	8.3	.0	24.8	6.3	50.1	4.7
Black walnut	57.2	.0	71.1	100.0	15.0	.0	47.1	24.9	.0	12.0
Yellow-poplar	35.3	.0	93.6	100.0	9.9	.0	44.6	12.0	.0	7.4
Blackgum	66.8	100.0	70.8	71.2	8.4	.0	59.4	16.2	.0	7.2
Aspen	49.0	.0	.0	100.0	22.5	.0	67.5	15.1	21.7	11.1
Black cherry	19.8	80.1	69.0	43.9	7.2	.0	21.1	4.8	28.3	3.7
Chestnut oak	37.7	.0	70.7	41.0	4.2	.0	76.9	12.3	63.2	3.9
Northern red oak	21.6	.0	57.9	29.6	4.3	.0	29.6	7.0	38.5	3.5
Select white oaks	25.0	.0	100.0	38.2	4.8	.0	44.5	9.7	39.0	4.2
Other oaks	36.3	.0	52.3	37.6	5.2	.0	52.2	12.9	68.8	4.8
Black locust	100.0	.0	.0	73.3	13.2	.0	54.7	17.0	100.0	10.4
Basswood	56.5	.0	.0	100.0	20.6	.0	92.1	9.9	79.6	9.0
Other hardwoods	26.3	72.2	67.7	38.2	7.8	.0	16.9	7.9	20.8	5.3
Total hardwoods	12.0	72.7	32.7	22.4	2.3	.0	11.1	2.4	16.6	1.1
All species	10.7	54.0	24.6	21.4	2.3	.0	11.1	2.4	16.1	1.0

Table 12.--Net volume of growing-stock trees on timberland by species and diameter class, Pennsylvania, 1989

(In millions of cubic feet)

Species	Diameter class (inches at breast height)										All classes	SE
	5.0- 6.9	7.0- 8.9	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0+		
White and red pine	68.0	97.6	124.2	116.7	100.0	62.4	54.8	55.1	104.5	18.0	801.2	8.4
Virginia pine	15.7	28.1	33.3	23.2	9.5	2.0	.5	.0	1.0	.0	113.4	18.0
Other yellow pines	22.5	44.7	41.8	32.1	24.1	13.7	4.4	2.7	1.2	.0	187.2	12.1
Eastern hemlock	113.4	178.9	175.5	191.5	186.6	131.7	96.1	61.6	121.8	11.3	1,268.4	5.4
Other softwoods	20.1	22.3	16.8	10.2	9.6	1.6	.8	.4	.5	.0	82.5	20.3
Total softwoods	239.8	371.6	391.5	373.8	329.8	211.5	156.6	119.8	229.1	29.4	2,452.7	4.2
Red maple	498.6	807.0	889.7	785.3	675.5	410.9	276.3	163.4	224.4	49.8	4,780.8	2.5
Sugar maple	171.8	376.1	436.7	407.4	344.8	226.7	154.3	94.3	138.3	32.6	2,383.1	4.1
Yellow birch	30.1	60.8	60.2	48.8	35.1	18.0	11.3	1.7	4.5	.7	271.0	8.2
Sweet birch	130.9	242.7	254.5	172.2	113.0	57.6	30.7	14.0	18.1	1.9	1,035.8	4.8
Hickory	36.9	105.2	144.2	126.1	101.1	66.6	33.0	27.0	16.9	4.8	661.8	6.1
Beech	95.2	146.5	176.2	164.9	145.6	143.7	92.3	84.7	118.9	17.5	1,185.5	5.2
White ash	69.5	125.0	185.3	214.8	189.5	150.0	93.6	77.5	95.1	18.7	1,219.0	4.7
Black walnut	9.6	16.6	14.5	17.9	20.7	14.1	9.4	5.0	5.3	.8	113.8	12.0
Yellow-poplar	20.5	37.5	70.9	100.2	128.6	127.6	116.9	98.0	129.6	34.1	863.7	7.4
Blackgum	42.5	36.9	25.6	19.9	12.9	9.6	4.4	4.0	6.5	.5	162.8	7.2
Aspen	39.1	60.7	54.3	39.2	12.8	8.0	2.5	.7	.0	.0	217.3	11.1
Black cherry	148.7	273.5	377.5	426.8	414.6	341.8	235.2	168.4	209.3	40.0	2,635.8	3.7
Chestnut oak	115.1	260.3	371.8	335.2	261.5	193.7	111.6	66.7	66.8	5.4	1,788.0	3.9
Northern red oak	75.6	179.9	283.2	377.6	372.9	347.7	301.3	219.1	367.7	94.4	2,619.5	3.5
Select white oaks	66.7	148.1	218.2	239.1	220.2	142.5	101.9	71.1	123.8	38.8	1,370.4	4.2
Other oaks	38.6	89.5	157.9	185.2	196.1	163.5	126.3	87.6	143.8	29.4	1,218.1	4.8
Black locust	22.1	36.3	45.4	28.2	27.9	19.1	9.8	6.0	11.1	.0	205.9	10.4
Basswood	12.3	44.5	57.8	73.0	72.8	40.7	22.0	13.3	14.4	4.1	354.9	9.0
Other hardwoods	86.7	166.6	203.7	187.4	134.4	75.8	57.7	34.3	67.7	34.3	1,048.6	5.3
Total hardwoods	1,710.7	3,213.7	4,027.6	3,949.3	3,480.2	2,557.4	1,790.6	1,236.7	1,762.0	407.9	24,136.0	1.1
All species	1,950.4	3,585.3	4,419.1	4,323.0	3,809.9	2,768.9	1,947.2	1,356.5	1,991.1	437.3	26,588.8	1.0
SE	1.7	1.6	1.5	1.5	1.7	2.0	2.5	2.8	3.0	6.0	1.0	

Table 12 (SE).--Net volume of growing-stock trees on timberland by species and diameter class, Pennsylvania, 1989

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)										All classes
	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+	
White and red pine	15.0	15.4	14.1	12.3	13.4	13.5	13.1	13.7	12.0	24.4	8.4
Virginia pine	21.5	19.6	22.3	22.0	25.5	50.9	100.0	.0	73.1	.0	18.0
Other yellow pines	21.8	18.2	15.0	16.5	19.5	22.0	38.0	55.1	72.4	.0	12.1
Eastern hemlock	7.3	6.5	6.9	7.7	7.5	8.4	10.2	11.7	11.2	25.9	5.4
Other softwoods	19.5	31.3	26.5	29.7	35.3	50.8	74.7	100.0	100.0	.0	20.3
Total softwoods	6.4	6.0	6.2	5.9	6.3	6.9	7.9	9.1	8.1	18.1	4.2
Red maple	3.2	3.3	3.4	3.7	4.3	5.3	6.6	7.3	7.1	14.6	2.5
Sugar maple	5.2	5.2	5.3	5.4	5.8	7.7	8.6	10.2	11.3	18.8	4.1
Yellow birch	11.8	10.4	10.8	11.8	16.1	18.9	25.7	59.1	43.0	100.0	8.2
Sweet birch	6.7	6.4	6.2	7.1	8.7	10.9	17.0	26.8	22.3	70.8	4.8
Hickory	10.1	9.3	8.4	8.1	10.0	11.4	15.3	18.3	25.5	45.4	6.1
Beech	7.3	6.9	7.3	7.9	8.1	9.5	10.8	11.6	11.8	26.9	5.2
White ash	7.5	7.5	7.4	6.6	7.3	8.2	10.1	11.4	10.8	22.1	4.7
Black walnut	21.5	18.3	21.8	19.0	17.6	23.1	23.8	34.2	37.0	100.0	12.0
Yellow-poplar	13.1	15.7	11.8	10.5	9.8	10.4	11.6	12.0	11.6	34.3	7.4
Blackgum	9.5	10.7	15.4	16.2	19.2	26.8	35.7	38.1	29.4	100.0	7.2
Aspen	14.5	14.2	15.5	16.4	25.4	27.8	51.3	100.0	.0	.0	11.1
Black cherry	6.5	5.6	5.4	5.3	5.9	6.2	7.1	8.5	8.2	21.0	3.7
Chestnut oak	7.2	5.6	5.1	5.3	6.2	6.9	8.1	10.6	10.8	38.4	3.9
Northern red oak	7.2	6.3	5.8	5.3	5.3	5.5	5.7	6.8	6.4	10.0	3.5
Select white oaks	8.9	6.9	6.5	6.1	6.3	7.6	8.7	10.3	10.1	17.3	4.2
Other oaks	9.5	8.0	7.3	7.0	7.7	8.3	8.7	10.8	9.9	16.7	4.8
Black locust	15.4	13.2	13.3	17.1	16.3	19.8	30.0	41.4	30.6	.0	10.4
Basswood	18.7	14.7	13.0	13.0	13.1	14.8	20.8	22.5	20.9	46.5	9.0
Other hardwoods	8.6	7.5	7.4	8.1	8.2	11.2	12.1	15.3	16.7	23.0	5.3
Total hardwoods	1.8	1.6	1.5	1.6	1.8	2.1	2.6	3.0	3.2	6.2	1.1
All species	1.7	1.6	1.5	1.5	1.7	2.0	2.5	2.8	3.0	6.0	1.0

Table 13.--Net volume of sawtimber trees on timberland by species and forest-type group, Pennsylvania, 1989

(In millions of board feet)

Species	Forest-type group									Total	SE
	White/ red pine	Spruce/ fir	Loblolly/ shortleaf	Oak/ pine	Oak/ hickory	Oak/gum/ cypress	Elm/ash/ red maple	Northern hardwoods	Aspen/ birch		
White and red pine	935.7	1.3	64.1	246.9	798.7	.0	9.1	645.2	45.1	2,746.3	8.6
Virginia pine	.0	.0	139.0	37.9	39.6	.0	1.5	17.3	.0	235.3	20.1
Other yellow pines	47.9	1.3	71.6	94.6	162.3	.0	2.0	42.2	4.5	426.5	13.5
Eastern hemlock	1,307.6	.0	.0	14.2	471.9	.0	18.7	2,102.1	19.3	3,933.8	6.0
Other softwoods	6.7	31.2	4.4	4.8	18.5	.0	2.0	66.9	13.7	148.1	23.2
Total softwoods	2,297.8	33.9	279.1	398.4	1,491.1	.0	33.4	2,873.7	82.6	7,489.9	4.7
Red maple	246.2	.0	12.4	26.6	3,259.8	.0	1,104.9	6,169.7	45.2	10,864.9	3.5
Sugar maple	18.5	.0	.0	4.9	354.3	.0	55.1	5,332.3	16.3	5,781.5	5.1
Yellow birch	33.4	.0	.0	.0	14.5	.0	1.8	448.0	.0	497.8	10.9
Sweet birch	61.8	.0	.0	5.9	516.7	.0	7.7	1,097.9	6.2	1,696.1	6.2
Hickory	29.3	.0	.0	9.2	1,136.0	.0	47.1	342.6	.0	1,564.1	7.1
Beech	107.2	.0	.0	.0	500.6	.0	33.5	2,759.8	4.0	3,405.1	6.3
White ash	43.8	2.5	11.6	28.0	949.5	.0	192.2	2,456.3	14.7	3,698.6	5.5
Black walnut	5.2	.0	5.2	2.0	186.2	.0	29.6	82.0	.0	310.1	13.3
Yellow-poplar	66.3	.0	13.2	4.7	2,341.9	.0	49.1	1,016.2	.0	3,491.5	7.9
Blackgum	.0	3.8	.0	.0	151.1	.0	3.1	81.3	.0	239.2	10.7
Aspen	9.3	.0	.0	.0	50.7	.0	13.3	138.0	58.3	269.6	14.8
Black cherry	117.6	8.2	2.6	17.9	1,494.2	.0	211.7	6,466.1	31.7	8,349.9	4.4
Chestnut oak	35.0	.0	4.7	22.6	3,713.4	.0	2.9	263.2	10.5	4,052.3	4.6
Northern red oak	91.6	.0	2.2	41.4	7,164.4	.0	56.7	1,552.1	62.8	8,971.1	3.9
Select white oaks	94.7	.0	4.7	39.1	3,396.7	.0	71.5	444.2	16.0	4,067.1	4.6
Other oaks	24.7	.0	4.2	32.7	3,631.1	.0	54.9	243.5	.0	3,991.1	5.4
Black locust	.0	.0	.0	3.6	327.4	.0	4.0	93.6	.0	428.6	13.8
Basswood	9.4	.0	.0	1.5	78.2	.0	3.0	946.5	6.5	1,045.1	9.4
Other hardwoods	46.8	2.5	6.5	16.0	705.8	.0	639.2	1,001.4	190.7	2,609.0	6.8
Total hardwoods	1,040.7	17.0	67.2	256.0	29,972.6	.0	2,581.4	30,934.7	463.0	65,332.7	1.5
All species	3,338.6	50.9	346.3	654.3	31,463.7	.0	2,614.8	33,808.4	545.6	72,822.6	1.4
SE	11.6	63.0	26.6	23.9	2.7	.0	12.4	2.7	20.3	1.4	

Table 13 (SE).--Net volume of sawtimber trees on timberland by species and forest-type group, Pennsylvania, 1989

(Standard error as percentage of total)

Species	Forest-type group									Total
	White/ red pine	Spruce/ fir	Loblolly/ shortleaf	Oak/ pine	Oak/ hickory	Oak/gum/ cypress	Elm/ash/ red maple	Northern hardwoods	Aspen/ birch	
White and red pine	20.4	100.0	41.1	32.2	10.1	.0	63.9	13.1	48.7	8.6
Virginia pine	.0	.0	30.9	47.0	22.7	.0	100.0	53.8	.0	20.1
Other yellow pines	58.2	100.0	34.6	35.3	14.7	.0	100.0	48.0	76.4	13.5
Eastern hemlock	13.9	.0	.0	64.8	12.6	.0	39.9	7.3	52.9	6.0
Other softwoods	72.0	64.2	70.7	100.0	46.5	.0	71.5	34.5	79.4	23.2
Total softwoods	12.2	61.6	26.1	24.4	7.6	.0	29.8	6.5	33.3	4.7
Red maple	19.1	.0	88.8	33.8	6.0	.0	19.4	4.8	29.9	3.5
Sugar maple	45.2	.0	.0	70.9	13.2	.0	42.1	5.5	58.4	5.1
Yellow birch	34.9	.0	.0	.0	39.1	.0	100.0	11.8	.0	10.9
Sweet birch	31.4	.0	.0	59.2	9.4	.0	51.4	8.5	57.7	6.2
Hickory	47.5	.0	.0	50.9	8.9	.0	30.9	13.1	.0	7.1
Beech	30.4	.0	.0	.0	14.3	.0	41.5	7.4	72.6	6.3
White ash	31.0	100.0	55.3	41.6	9.8	.0	27.6	7.2	56.4	5.5
Black walnut	70.8	.0	71.2	100.0	17.1	.0	49.9	26.3	.0	13.3
Yellow-poplar	39.0	.0	100.0	100.0	10.7	.0	49.7	12.6	.0	7.9
Blackgum	.0	100.0	.0	.0	13.3	.0	70.8	19.6	.0	10.7
Aspen	63.2	.0	.0	.0	29.8	.0	84.5	19.9	36.4	14.8
Black cherry	23.5	100.0	100.0	54.1	9.2	.0	24.5	5.4	39.2	4.4
Chestnut oak	35.6	.0	100.0	36.8	5.0	.0	100.0	14.1	70.2	4.6
Northern red oak	24.3	.0	100.0	32.6	4.7	.0	30.9	7.7	43.4	3.9
Select white oaks	24.3	.0	100.0	41.2	5.4	.0	44.9	10.8	44.8	4.6
Other oaks	42.7	.0	59.9	45.6	5.8	.0	59.9	14.8	.0	5.4
Black locust	.0	.0	.0	71.3	17.2	.0	58.3	20.4	.0	13.8
Basswood	59.6	.0	.0	100.0	22.9	.0	100.0	10.2	73.1	9.4
Other hardwoods	35.7	100.0	100.0	50.8	10.3	.0	19.6	9.9	27.4	6.8
Total hardwoods	13.2	86.5	40.5	26.4	2.8	.0	12.5	2.8	21.7	1.5
All species	11.6	63.0	26.6	23.9	2.7	.0	12.4	2.7	20.3	1.4

Table 14.--Net volume of sawtimber trees on timberland by species and diameter class, Pennsylvania, 1989

(In millions of board feet)

Species	Diameter class (inches at breast height)								All classes	SE
	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.9	19.0-20.9	21.0-28.9	29.0+		
White and red pine	437.4	478.4	437.2	276.2	262.5	246.9	530.4	77.3	2,746.3	8.6
Virginia pine	101.9	82.1	36.6	8.1	2.2	.0	4.4	.0	235.3	20.1
Other yellow pines	124.9	114.4	94.4	56.5	19.5	11.2	5.5	.0	426.5	13.5
Eastern hemlock	529.0	720.7	758.7	566.8	445.8	272.4	590.0	50.4	3,933.8	6.0
Other softwoods	54.8	39.8	38.5	6.5	4.0	2.3	2.2	.0	148.1	23.2
Total softwoods	1,248.1	1,435.3	1,365.5	914.0	734.1	532.7	1,132.5	127.7	7,489.9	4.7
Red maple	.0	2,898.1	2,818.7	1,864.1	1,252.7	756.0	992.0	283.3	10,864.9	3.5
Sugar maple	.0	1,522.4	1,405.1	936.9	703.5	418.5	639.9	155.2	5,781.5	5.1
Yellow birch	.0	196.3	147.3	71.8	49.0	8.4	21.4	3.4	497.8	10.9
Sweet birch	.0	692.5	475.0	231.6	132.2	69.7	85.1	10.1	1,696.1	6.2
Hickory	.0	472.4	438.0	279.4	160.4	89.6	97.9	26.5	1,564.1	7.1
Beech	.0	646.8	640.2	599.7	449.8	359.4	606.5	102.7	3,405.1	6.3
White ash	.0	874.3	841.2	663.3	446.8	369.8	392.0	111.2	3,698.6	5.5
Black walnut	.0	67.2	87.4	60.5	41.7	23.6	25.1	4.5	310.1	13.3
Yellow-poplar	.0	384.1	546.5	603.0	600.5	464.2	692.6	200.5	3,491.5	7.9
Blackgum	.0	74.0	52.9	40.1	19.6	18.0	32.4	2.3	239.2	10.7
Aspen	.0	160.2	58.2	35.3	12.4	3.5	.0	.0	269.6	14.8
Black cherry	.0	1,628.7	1,794.0	1,589.9	1,147.9	867.8	1,101.5	220.1	8,349.9	4.4
Chestnut oak	.0	1,219.1	990.8	766.9	462.3	290.1	291.2	31.9	4,052.3	4.6
Northern red oak	.0	1,401.4	1,539.4	1,450.7	1,346.6	1,010.5	1,794.5	428.1	8,971.1	3.9
Select white oaks	.0	904.5	933.4	621.0	451.9	332.9	596.3	227.1	4,067.1	4.6
Other oaks	.0	688.6	809.6	684.9	567.9	401.2	705.8	133.2	3,991.1	5.4
Black locust	.0	105.1	117.1	82.1	43.3	27.5	53.5	.0	428.6	13.8
Basswood	.0	281.7	327.4	189.1	100.1	60.3	62.1	24.4	1,045.1	9.4
Other hardwoods	.0	747.6	586.1	332.3	259.8	160.3	322.3	200.5	2,609.0	6.8
Total hardwoods	.0	14,964.8	14,608.6	11,102.6	8,248.4	5,731.5	8,512.2	2,164.7	65,332.7	1.5
All species	1,248.1	16,400.2	15,974.0	12,016.6	8,982.5	6,264.2	9,644.7	2,292.3	72,822.6	1.4
SE	6.6	1.5	1.7	2.1	2.5	2.8	3.0	6.2	1.4	

Table 14 (SE).--Net volume of sawtimber trees on timberland by species and diameter class, Pennsylvania, 1989

(Standard error as percentage of total)

Species	Diameter class (inches at breast height)								All classes
	9.0- 10.9	11.0- 12.9	13.0- 14.9	15.0- 16.9	17.0- 18.9	19.0- 20.9	21.0- 28.9	29.0+	
White and red pine	14.6	12.5	13.6	13.6	13.0	13.9	12.2	24.7	8.6
Virginia pine	22.5	22.5	25.9	50.9	100.0	.0	73.0	.0	20.1
Other yellow pines	15.0	16.5	19.4	22.0	38.1	55.5	72.4	.0	13.5
Eastern hemlock	6.9	7.6	7.6	8.4	10.2	11.7	11.2	26.2	6.0
Other softwoods	26.6	31.3	36.0	50.8	76.8	100.0	100.0	.0	23.2
Total softwoods	6.6	6.1	6.4	6.9	7.9	9.2	8.2	18.2	4.7
Red maple	.0	3.7	4.3	5.3	6.6	7.4	7.1	14.7	3.5
Sugar maple	.0	5.5	5.9	7.8	8.6	10.2	11.4	18.9	5.1
Yellow birch	.0	11.9	16.2	18.9	25.7	59.1	43.3	100.0	10.9
Sweet birch	.0	7.1	8.7	10.9	17.0	26.7	22.3	70.7	6.2
Hickory	.0	8.1	10.0	11.4	15.4	18.3	25.5	45.3	7.1
Beech	.0	7.9	8.1	9.5	10.8	11.6	11.9	26.8	6.3
White ash	.0	6.7	7.3	8.2	10.1	11.5	10.8	22.1	5.5
Black walnut	.0	19.0	17.6	23.1	23.8	34.1	37.1	100.0	13.3
Yellow-poplar	.0	10.5	9.9	10.5	11.6	12.0	11.5	34.7	7.9
Blackgum	.0	16.2	19.2	26.9	35.7	38.1	29.3	100.0	10.7
Aspen	.0	16.4	25.6	27.9	51.7	100.0	.0	.0	14.8
Black cherry	.0	5.3	5.9	6.2	7.1	8.5	8.2	21.0	4.4
Chestnut oak	.0	5.3	6.2	6.9	8.1	10.6	10.8	38.3	4.6
Northern red oak	.0	5.3	5.3	5.5	5.7	6.8	6.4	10.0	3.9
Select white oaks	.0	6.1	6.3	7.7	8.7	10.3	10.1	17.3	4.6
Other oaks	.0	7.0	7.7	8.3	8.7	10.8	10.0	16.8	5.4
Black locust	.0	17.2	16.3	19.9	30.1	41.4	30.6	.0	13.8
Basswood	.0	12.9	13.0	14.8	20.8	22.5	20.9	46.5	9.4
Other hardwoods	.0	8.2	8.3	11.2	12.2	15.3	17.1	23.0	6.8
Total hardwoods	.0	1.6	1.8	2.2	2.6	3.0	3.2	6.5	1.5
All species	6.6	1.5	1.7	2.1	2.5	2.8	3.0	6.2	1.4

McWilliams, William H.; Alerich, Carol A.; Devlin, Daniel A.; Lister, Andrew J.; Lister, Tonya W.; Sterner, Stephen L.; Westfall, James A. 2004. **Annual inventory report for Pennsylvania's forests: results from the first three years.** Resour. Bull. NE-159. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northeastern Research Station. 95 p.

In 2000, the USDA Forest Service's Forest Inventory and Analysis (FIA) program implemented a new system for inventory and monitoring Pennsylvania's forests. The most salient feature of the new inventory process will be a nearly threefold improvement in timeliness. This report summarizes the results for the first 3 years of annual inventory measurements. The area of forest land in Pennsylvania has remained stable since a previous inventory in 1989. The State's forests continue to mature as larger trees and an increase in inventory volume were recorded. A separate study of tree seedlings revealed a general lack of regeneration in half of stands in which regeneration should be adequate.

Keywords: forest composition; forest health; sustainability; timber volume; tree regeneration

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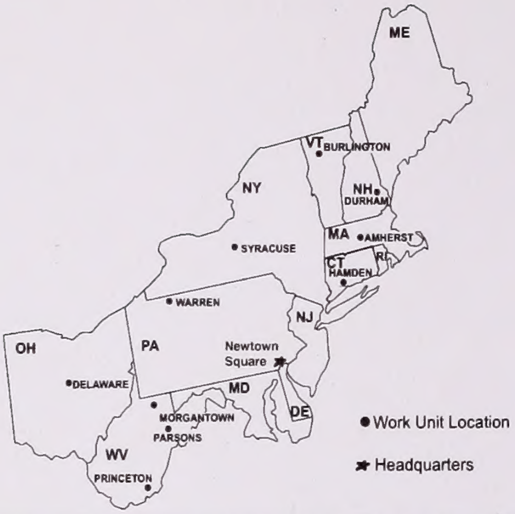

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